

FIG. 1A

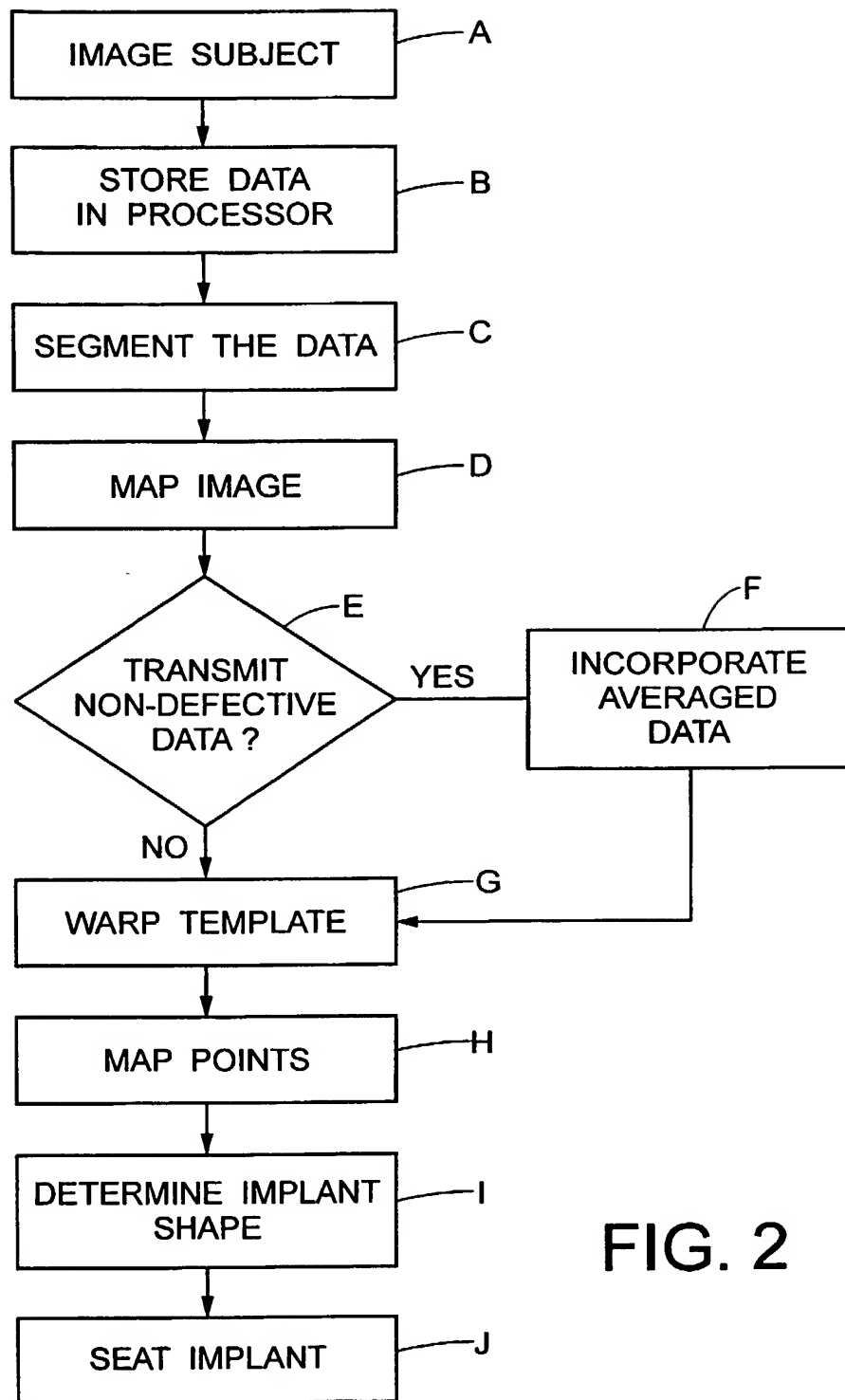


FIG. 2

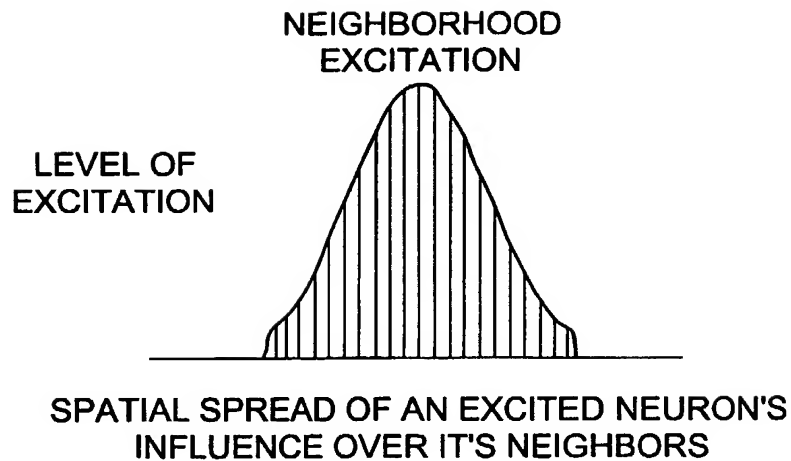


FIG. 3

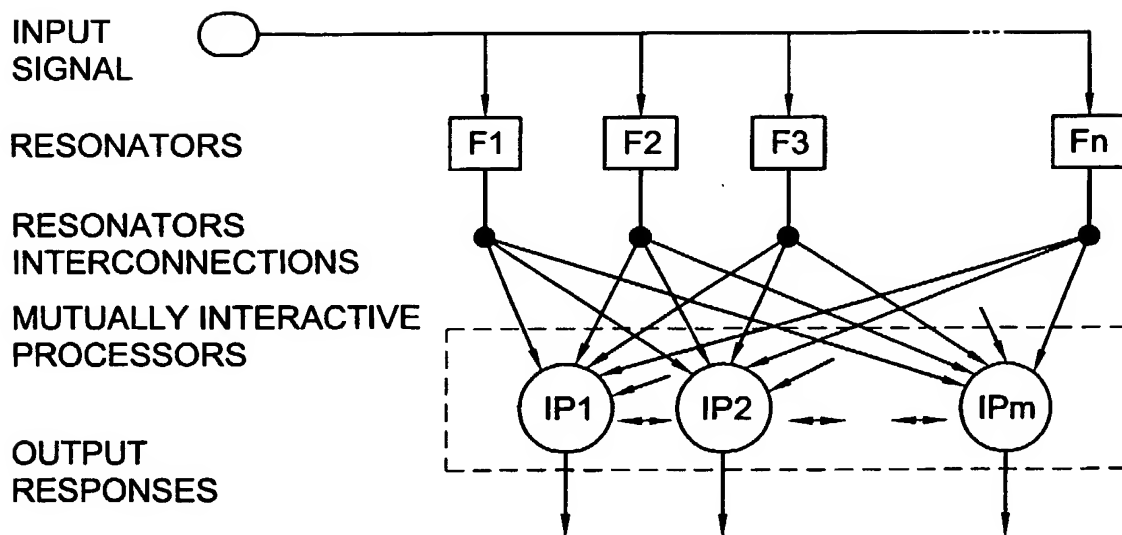


FIG. 4

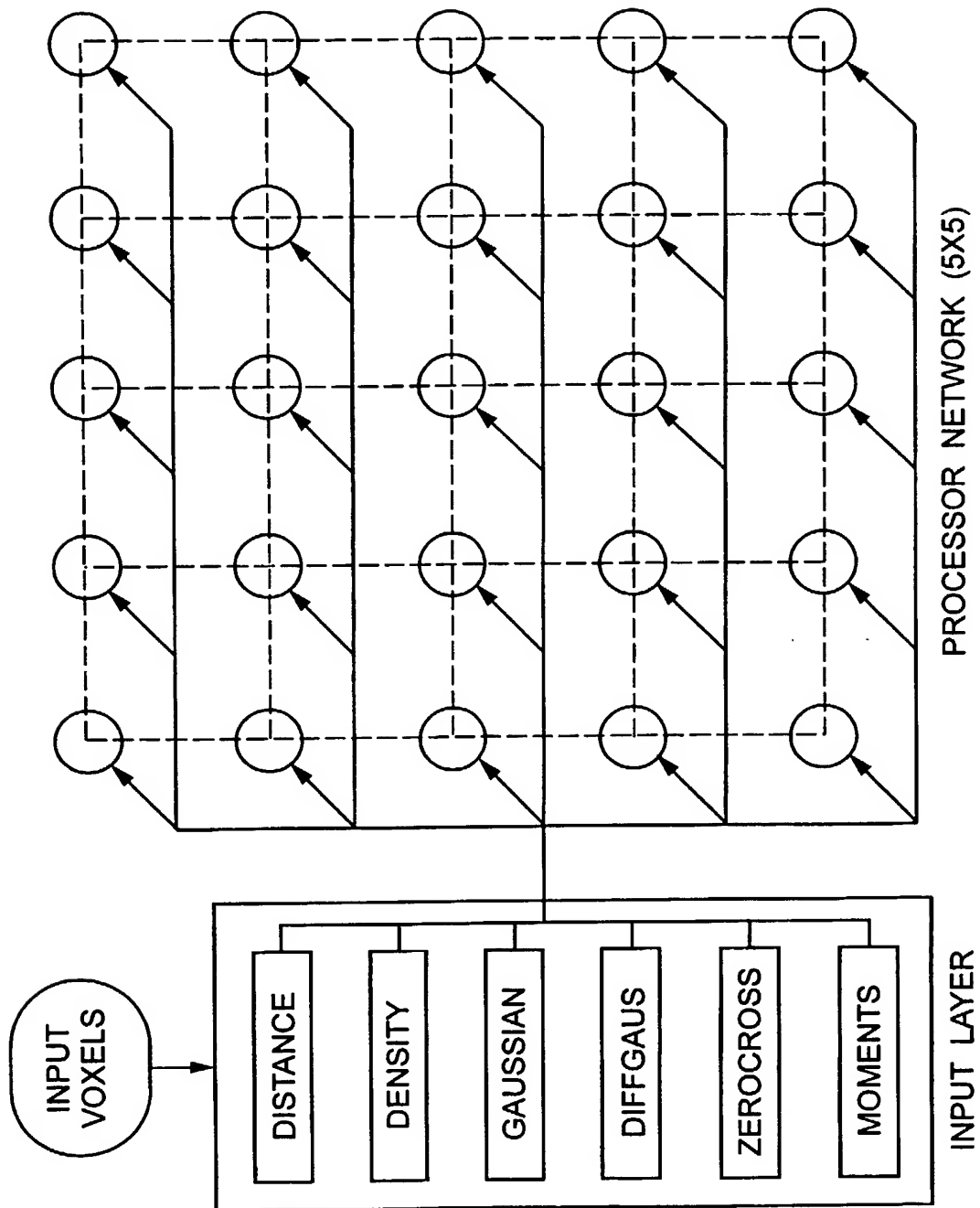


FIG. 5

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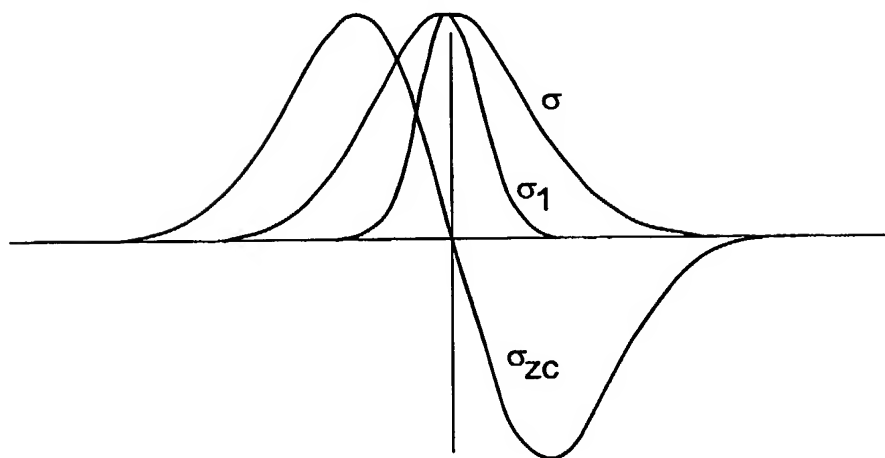
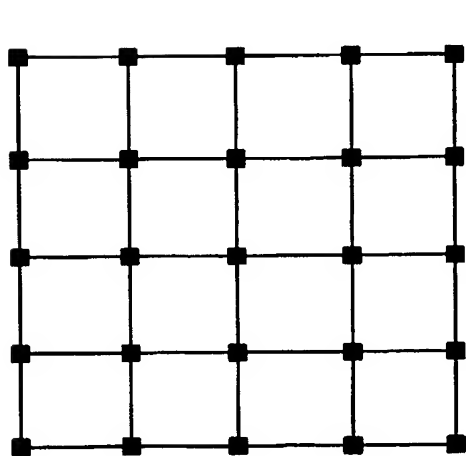
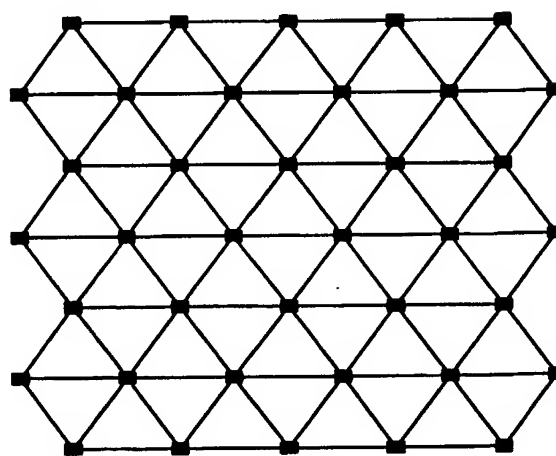
ZERO CROSSING AND
GAUSSIAN CURVES

FIG. 6

PROCESSOR GRID CONFIGURATION



RECTANGULAR



HEXAGONAL

FIG. 7

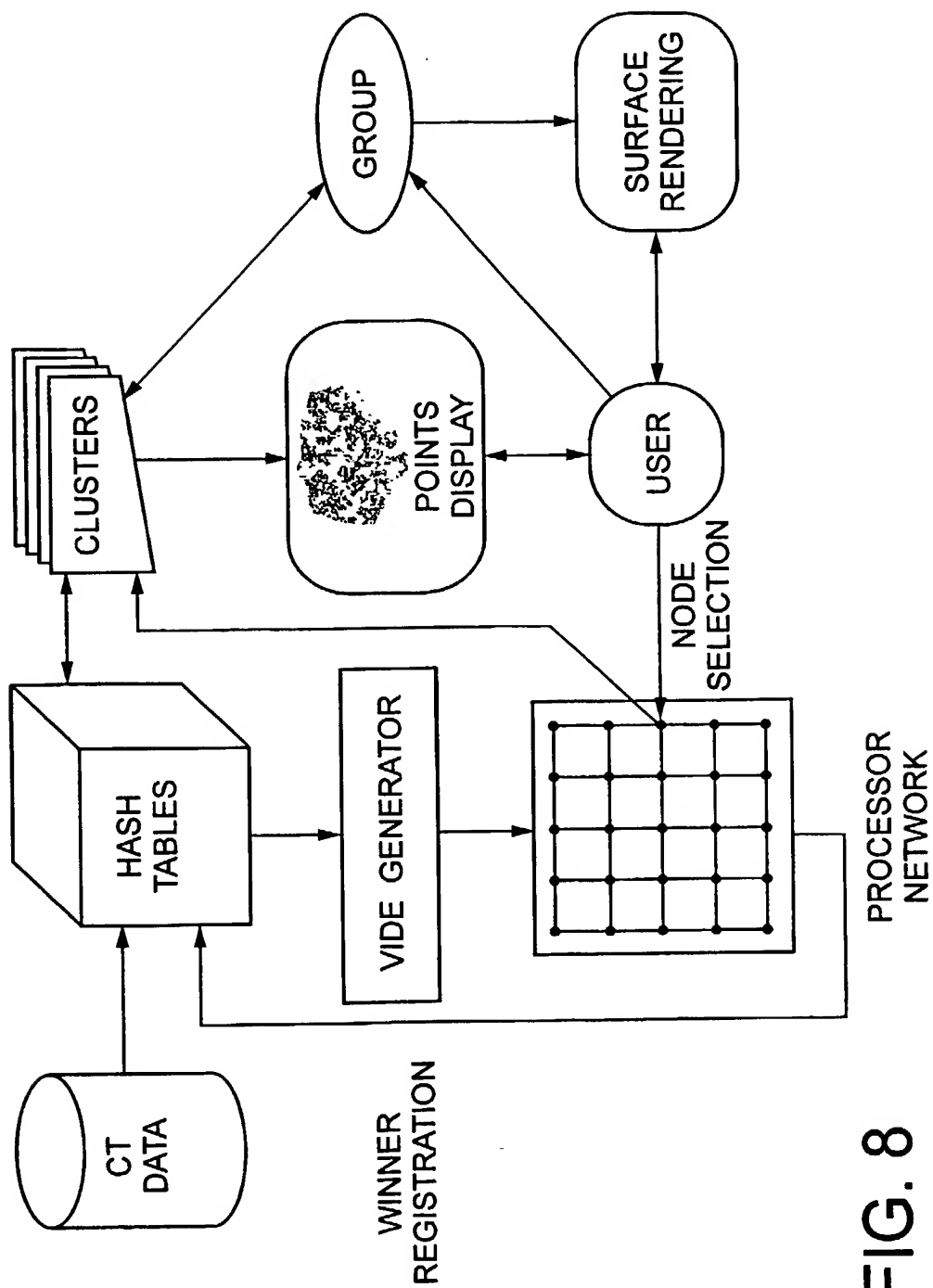


FIG. 8

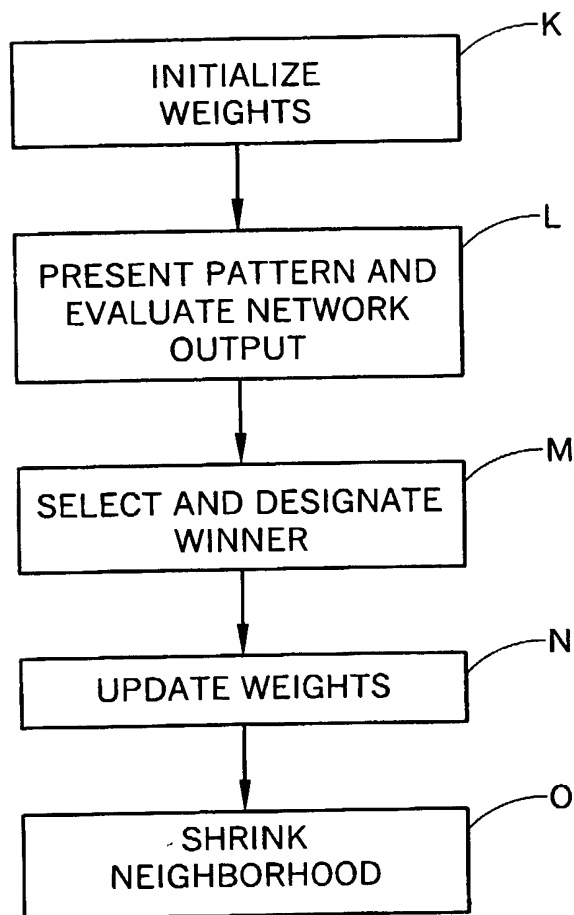


FIG. 9

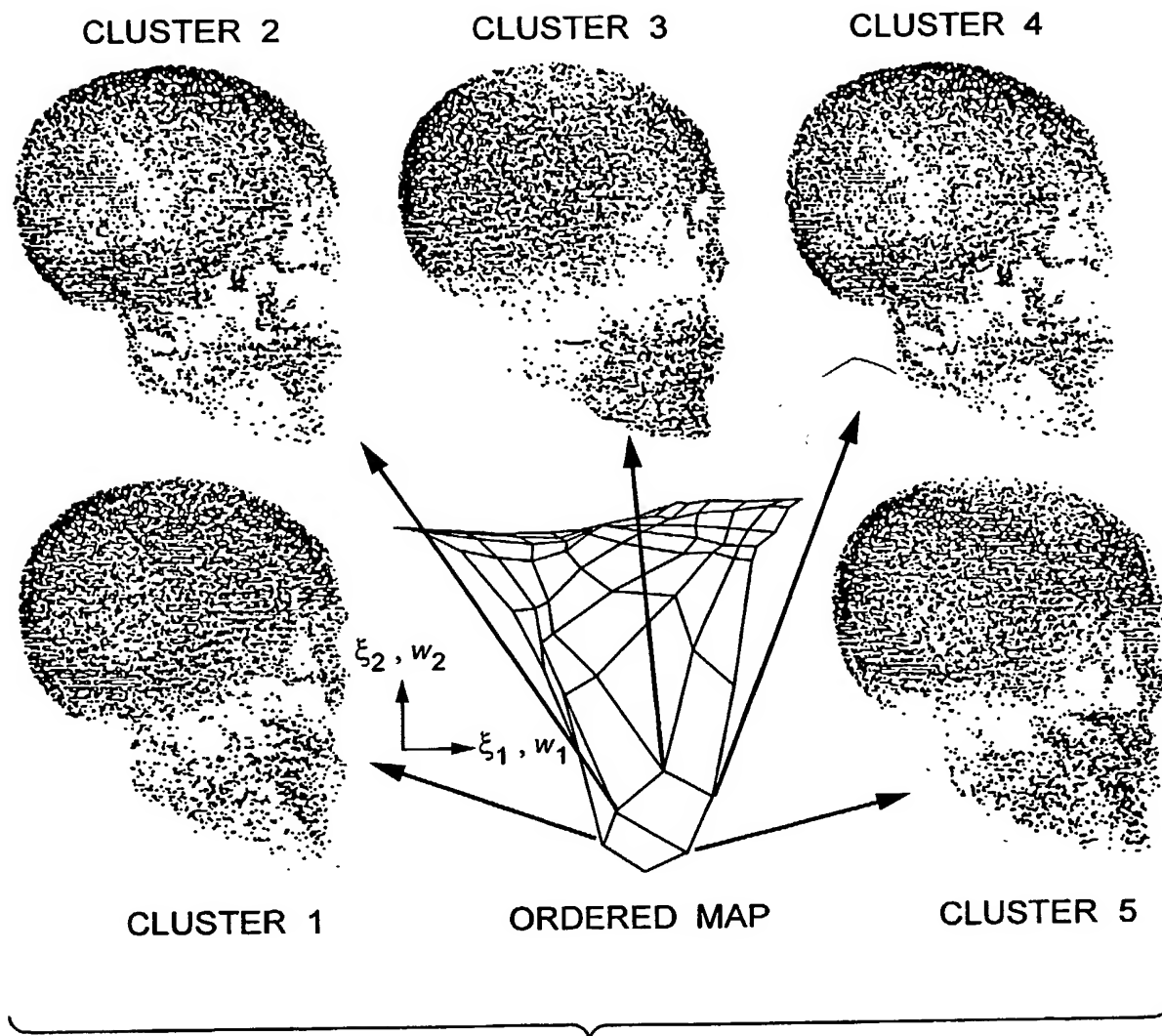


FIG. 10

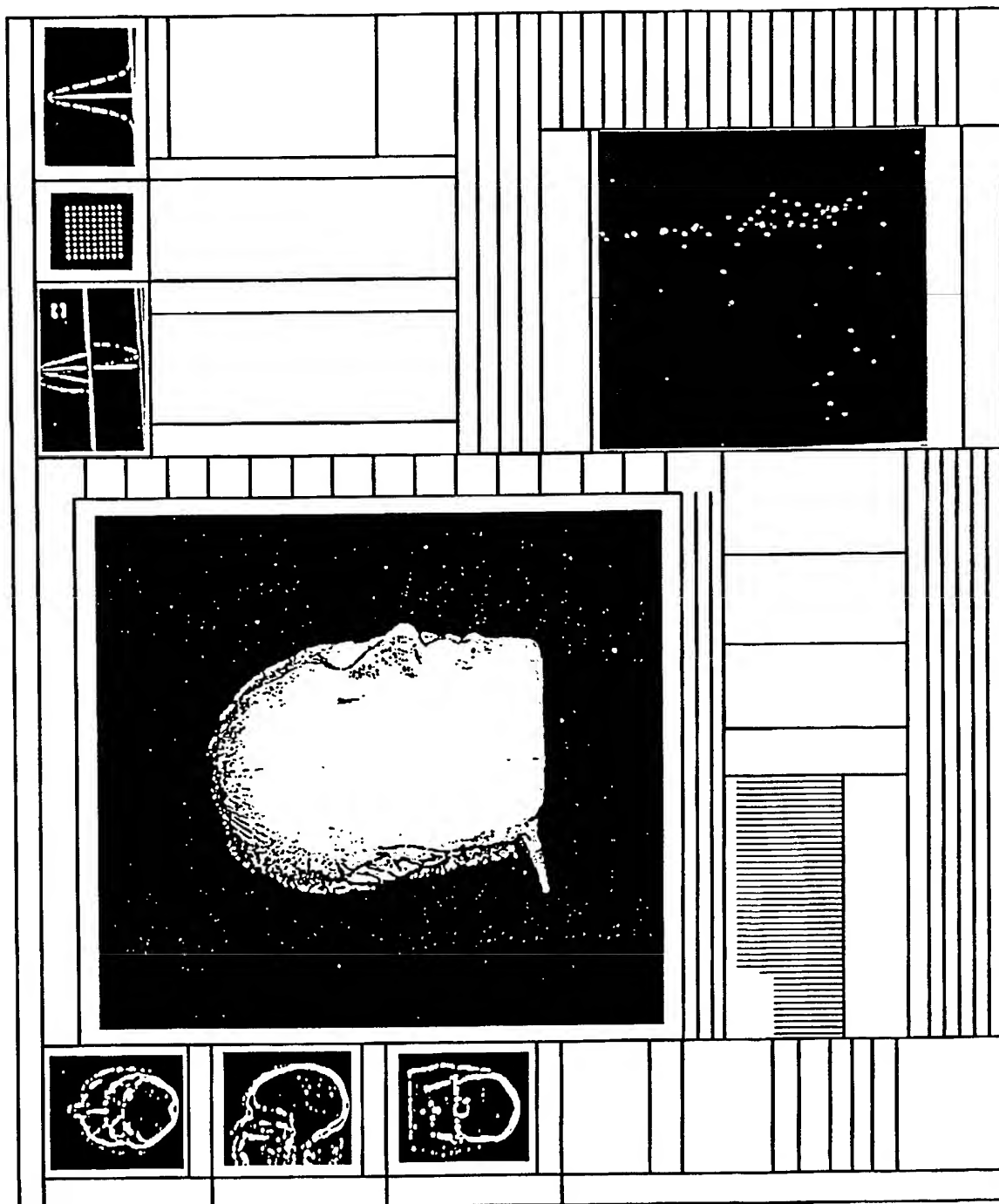
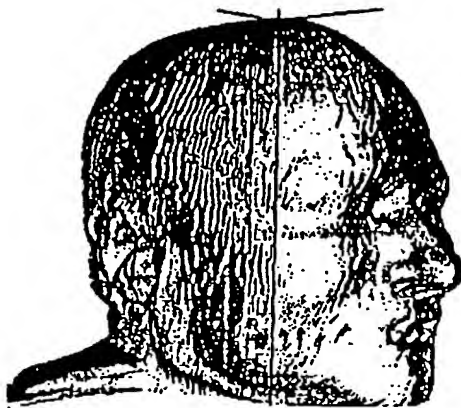


FIG. 11



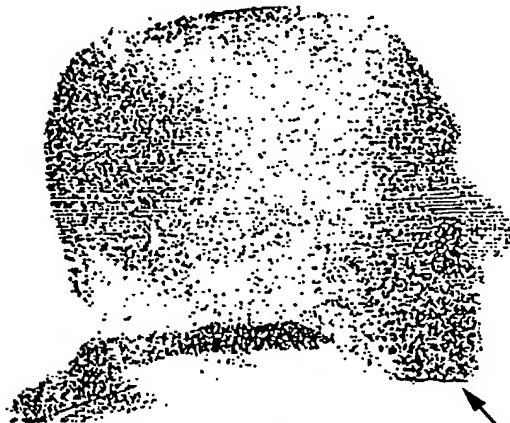
A. SURFACE RENDERING
OF VOXELS IN C.

FIG. 12A



B. SURFACE RENDERING
OF VOXELS IN D.

FIG. 12B



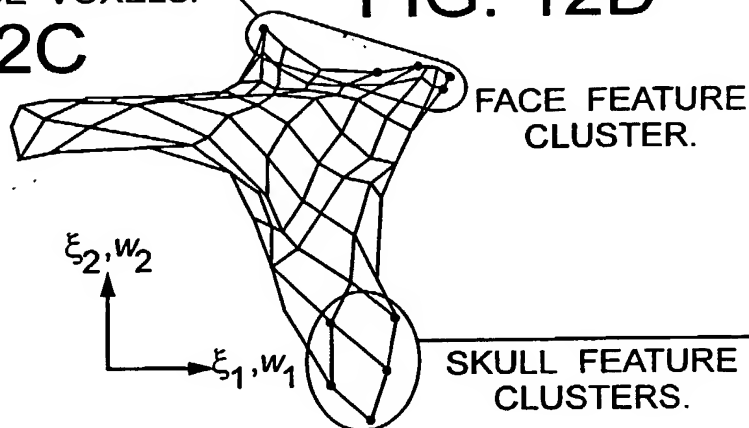
C. BACK PROJECTED
SOFT TISSUE FACE VOXELS.

FIG. 12C



D. BACK PROJECTED
SKULL VOXELS.

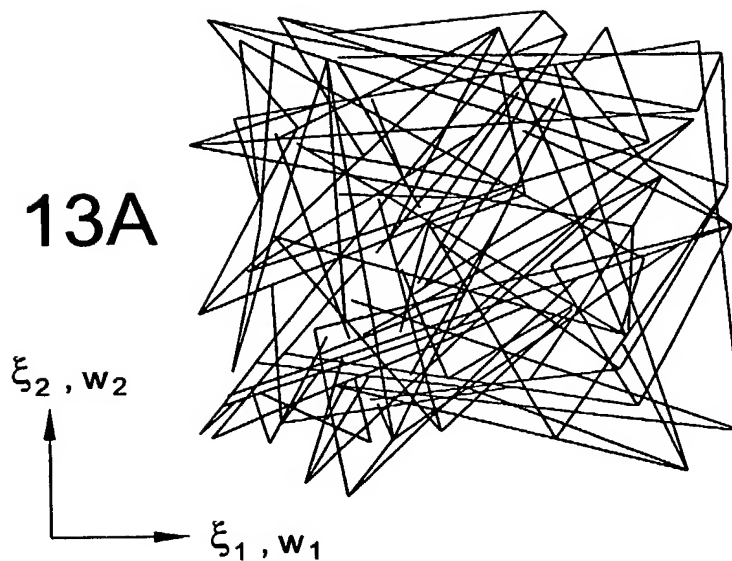
FIG. 12D



E. FINAL PROCESSOR
ORDERED MAP.

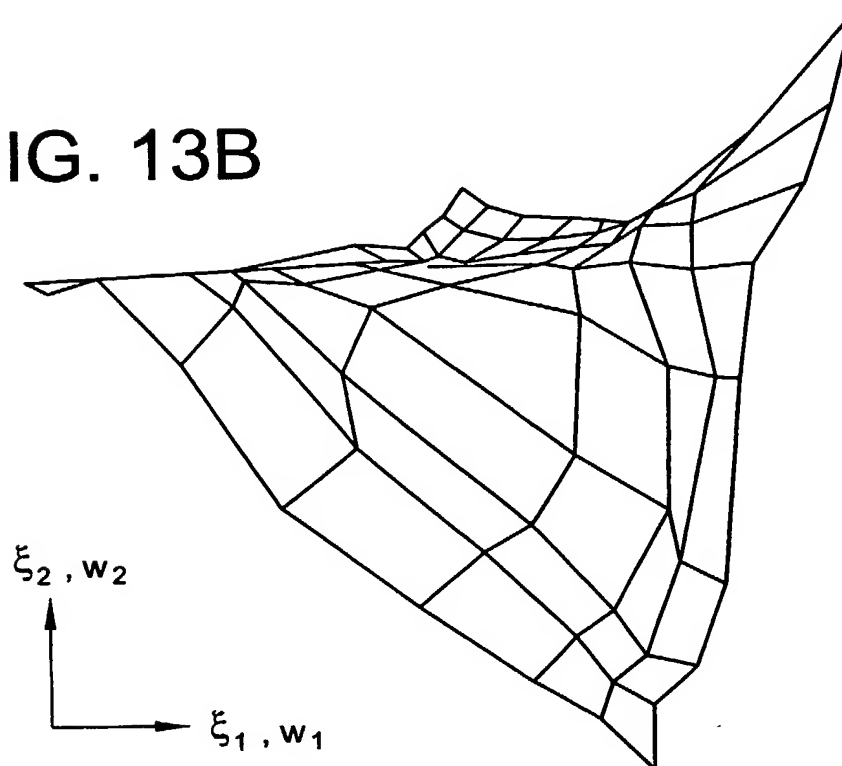
FIG. 12E

FIG. 13A



UNORGANIZED MAP PRIOR
TO INPUT EVENT ORDERING

FIG. 13B



FINAL ORDERED MAP OF PROCESSORS
AND ASSOCIATED FEATURE CLUSTERS

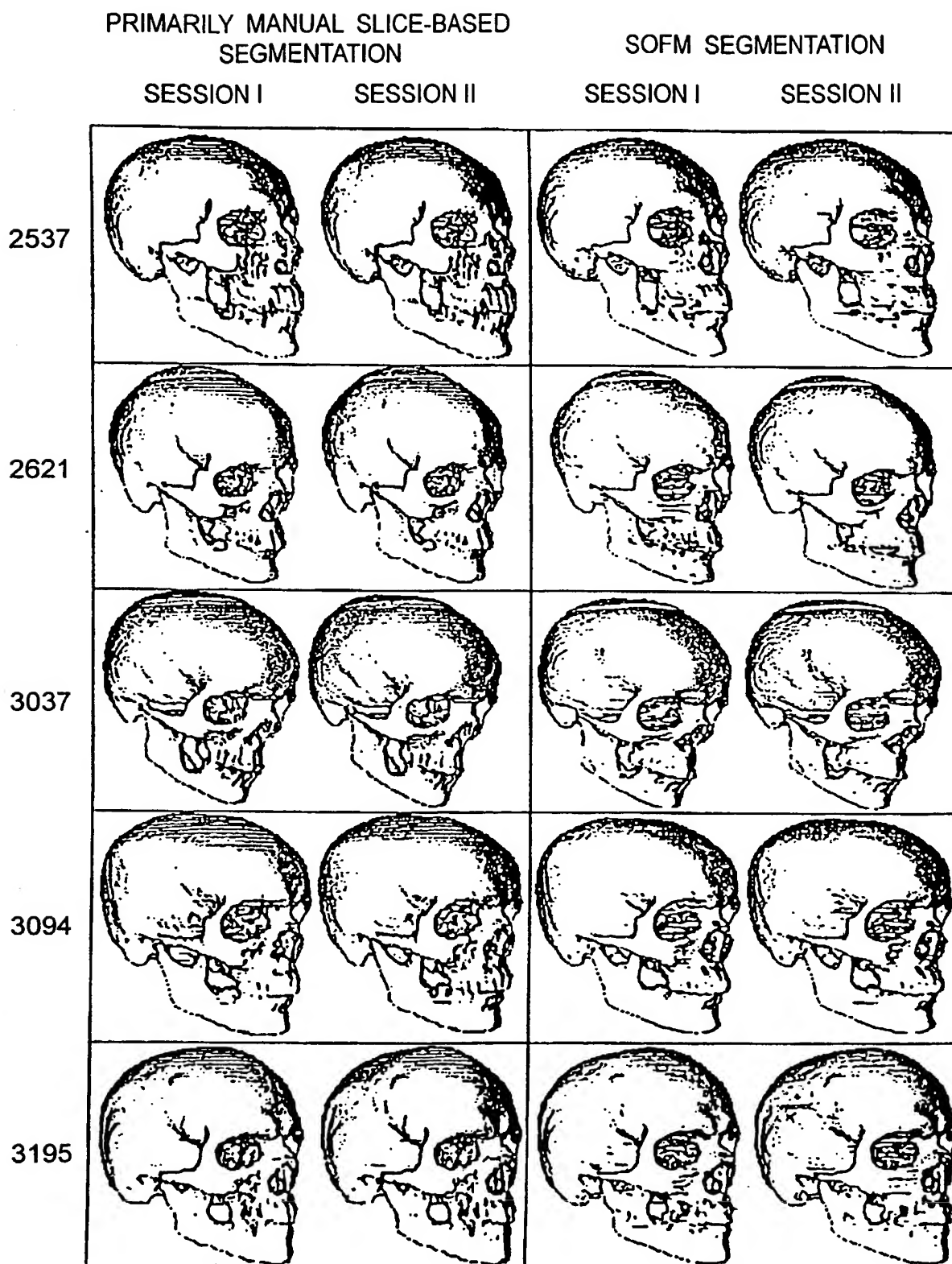


FIG. 14

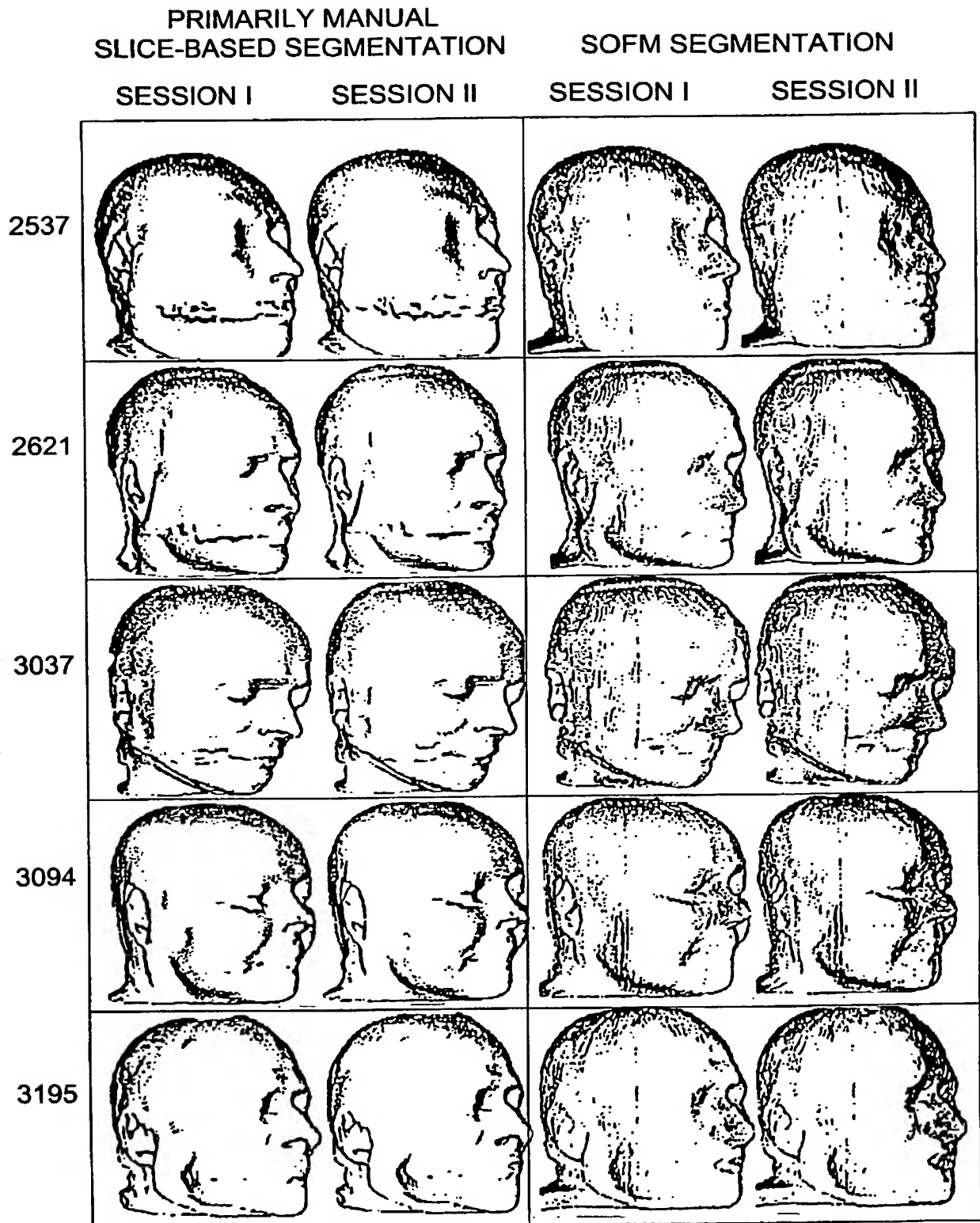


FIG. 15

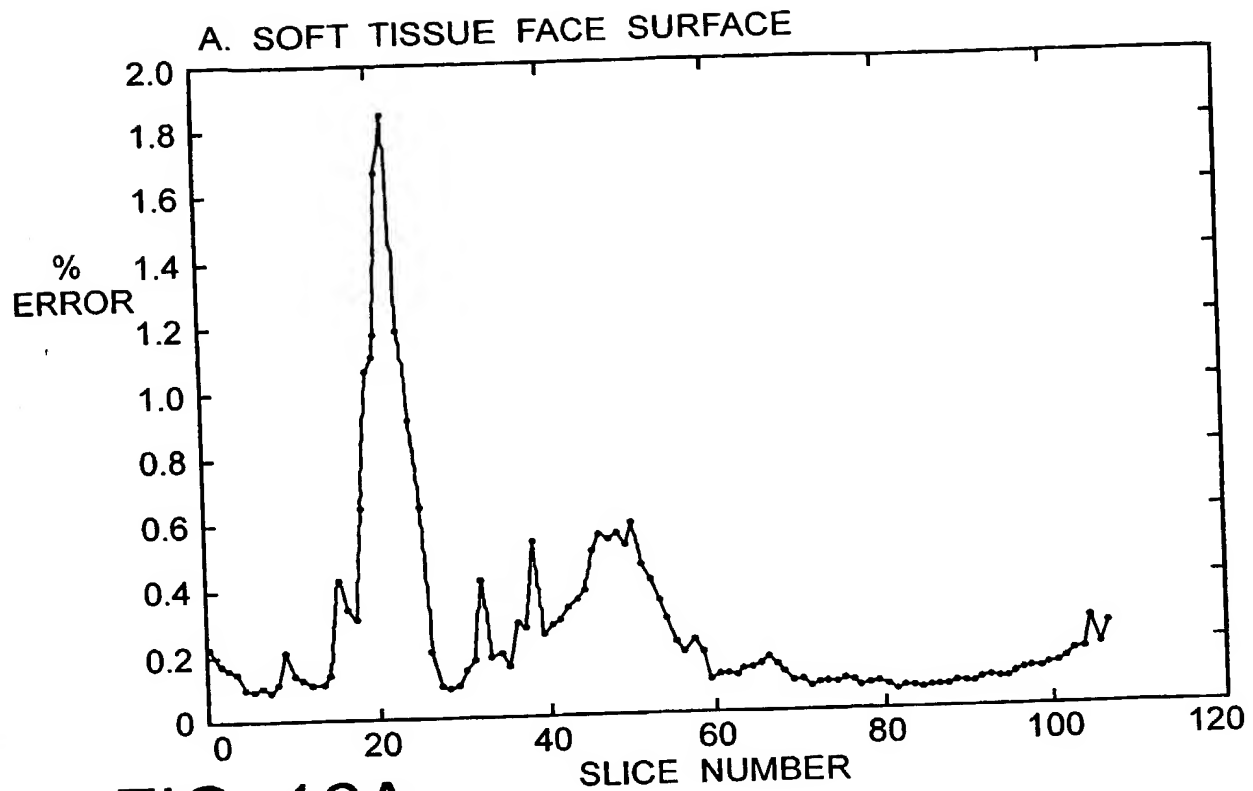


FIG. 16A

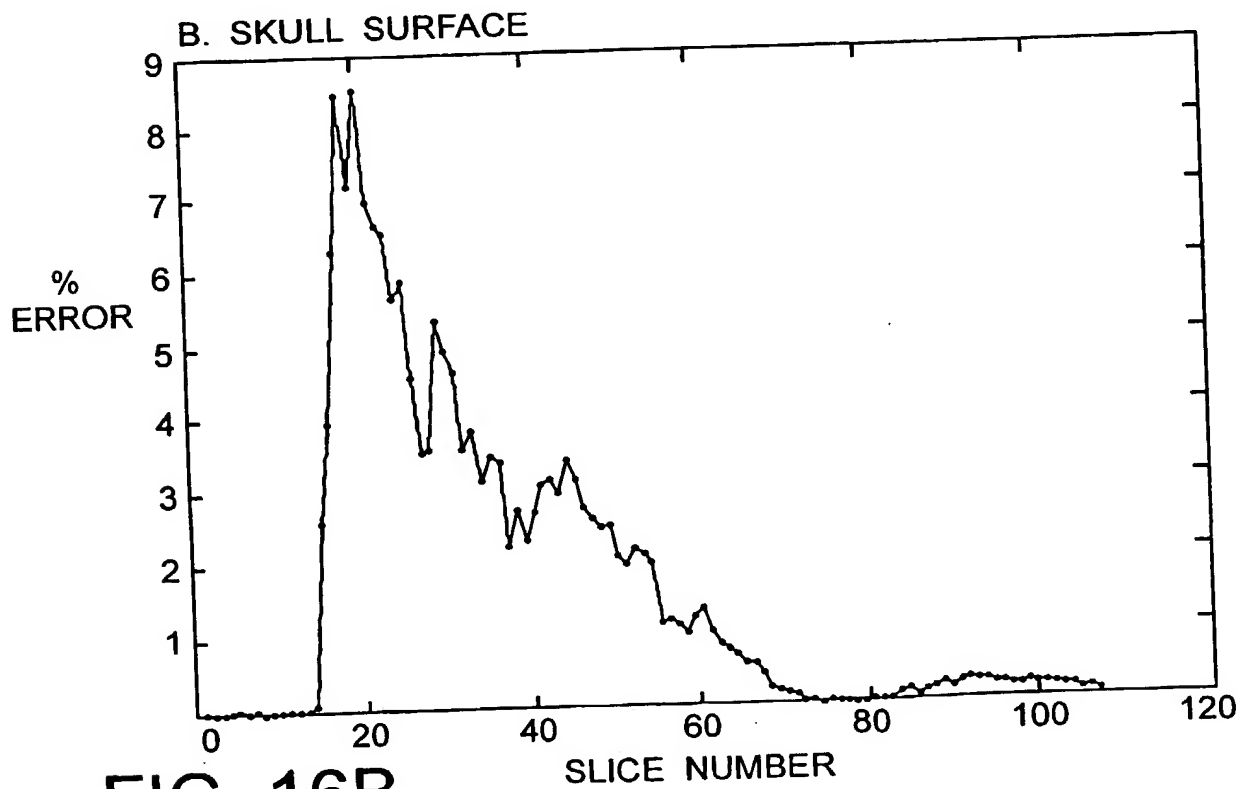


FIG. 16B

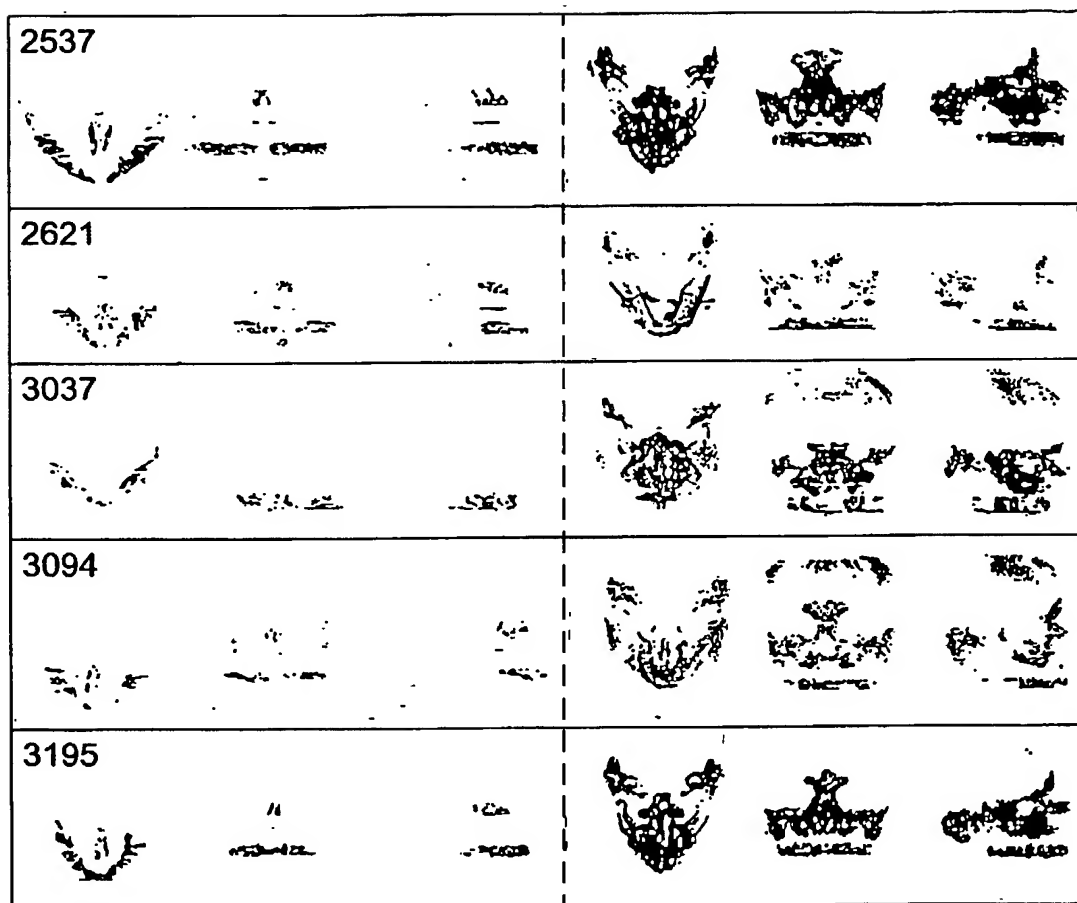
A. SOFT TISSUE FACE 3D
IMAGE DIFFERENCESB. SKULL 3D IMAGE
DIFFERENCES

FIG. 17

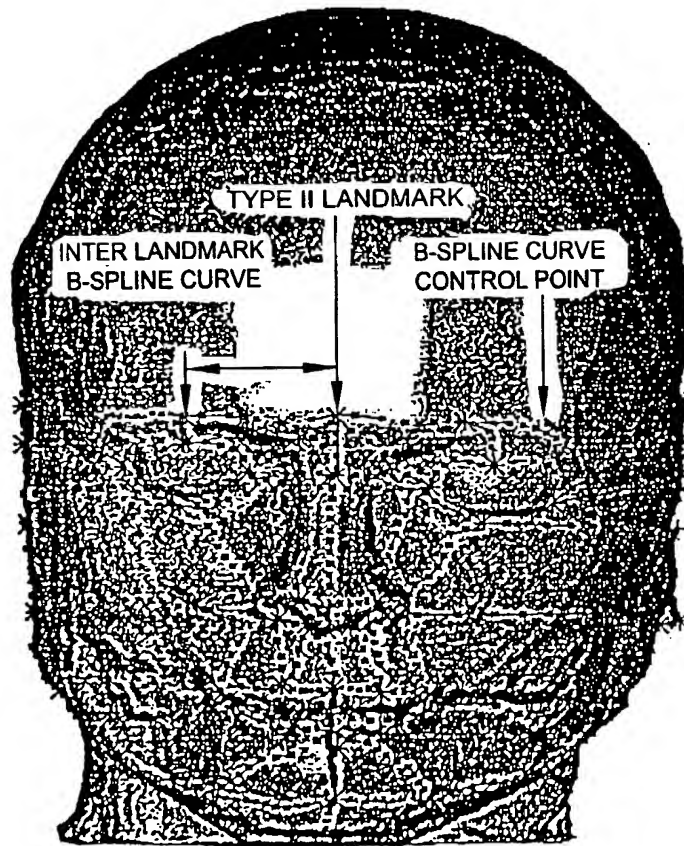


FIG.18

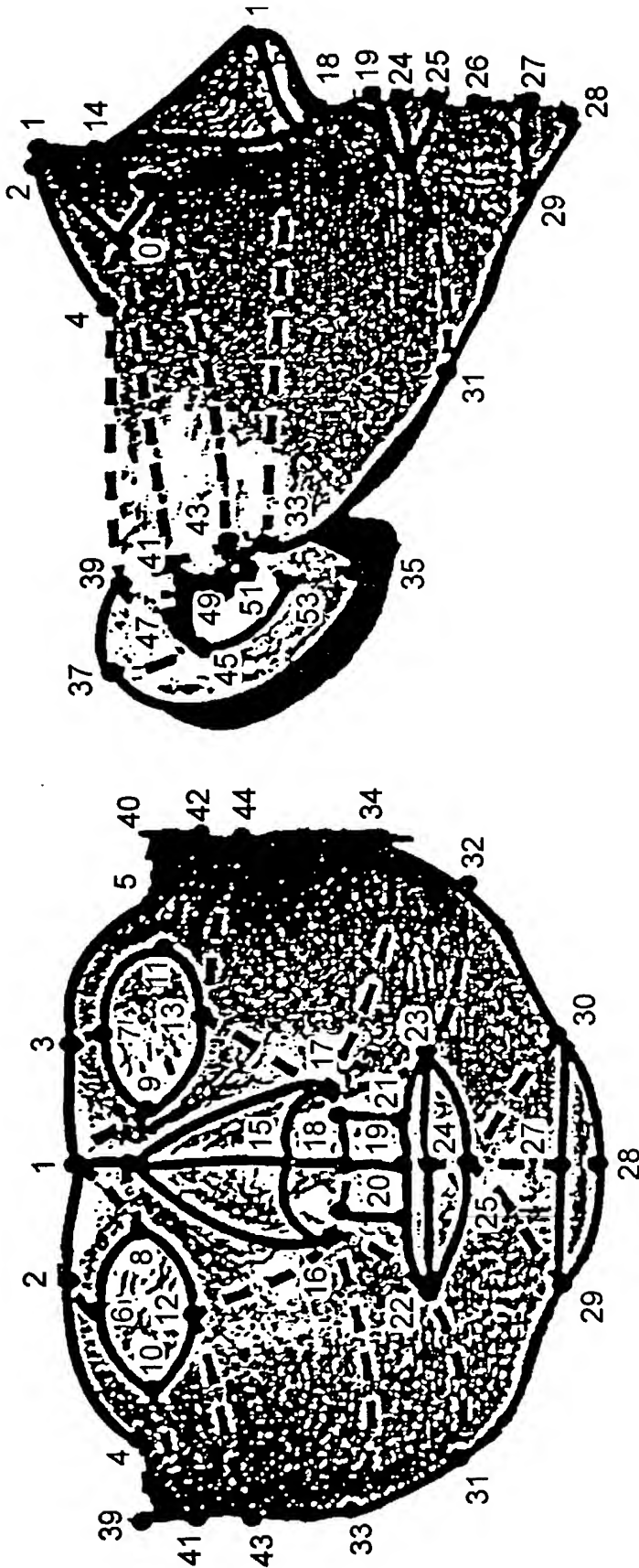


FIG. 19A

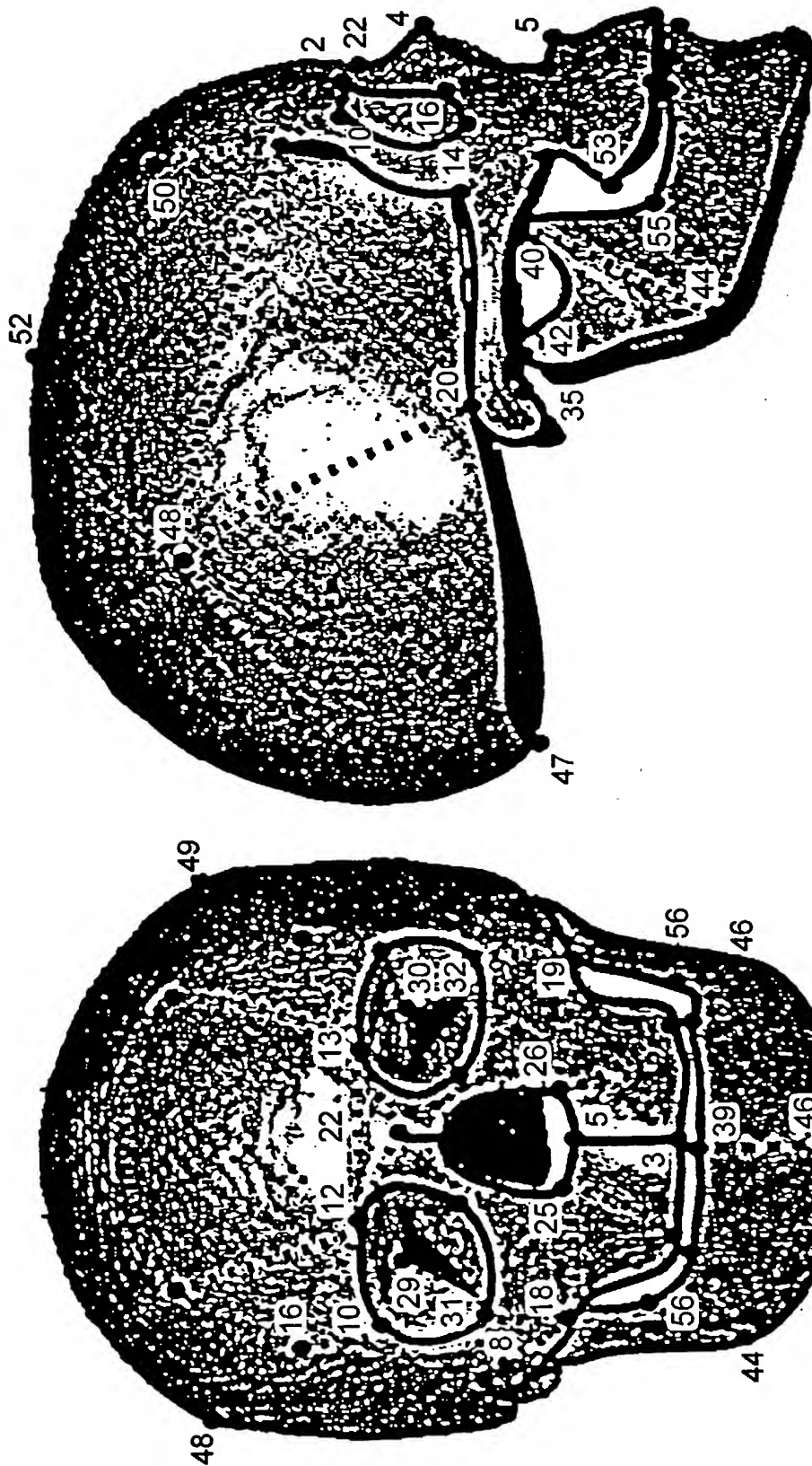
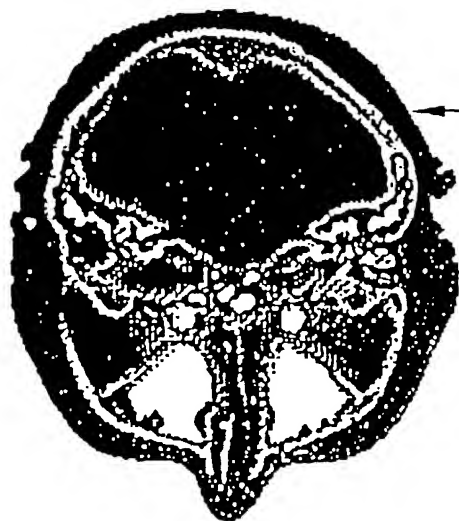


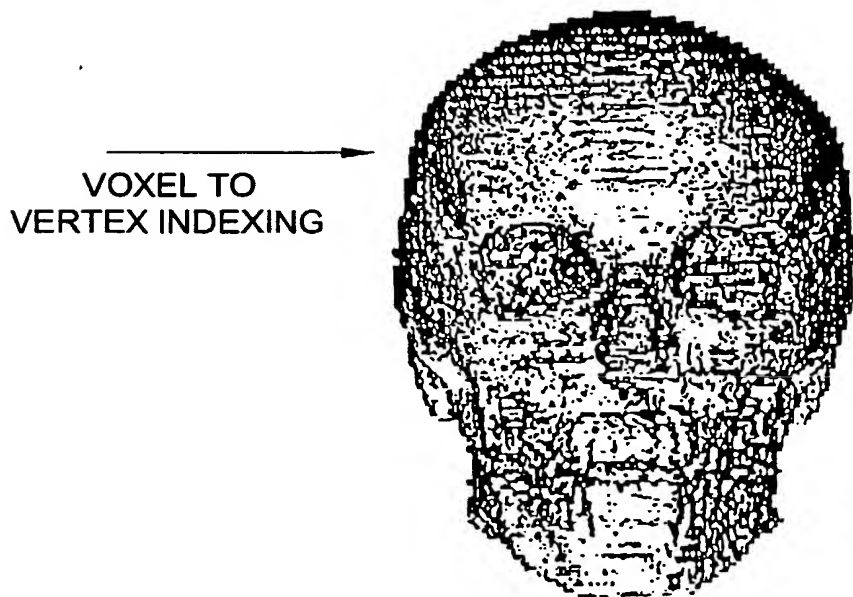
FIG. 19B



VOXEL TO
VERTEX INDEXING

VOLUMN IMAGE, SLICE NUMBER 50

FIG. 20A



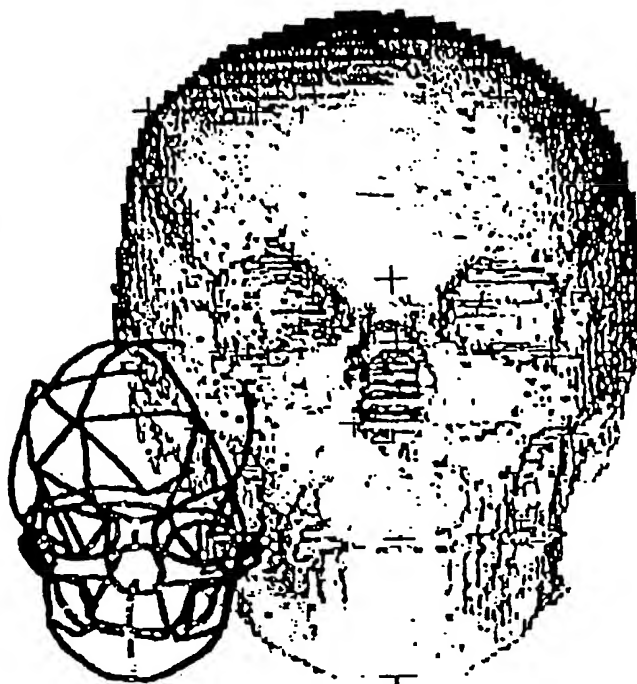
VOXEL TO
VERTEX INDEXING

RENDERED SKULL SURFACE

FIG. 20B

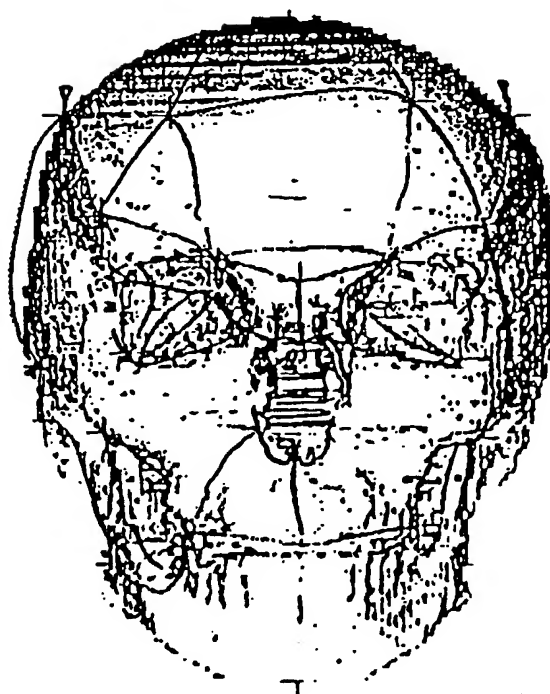
WIREFRAME TEMPLATE AND GRAPHICAL MANIFOLD.

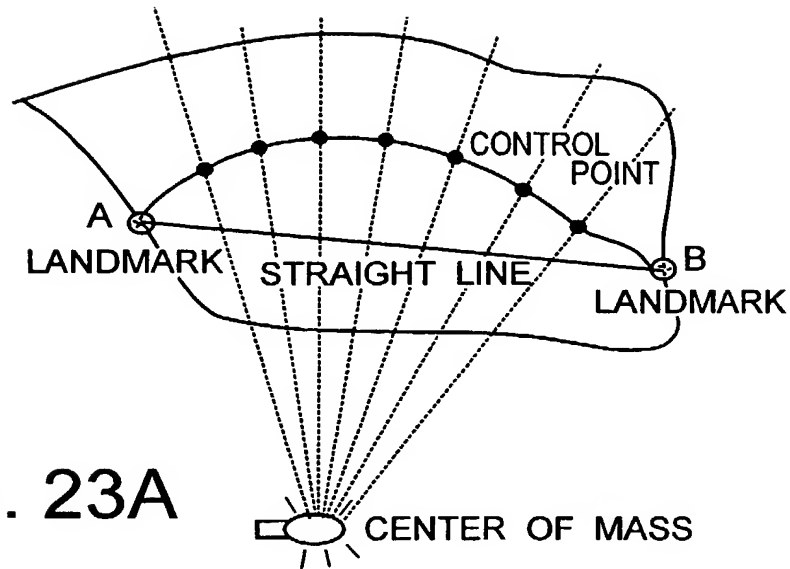
FIG. 21A



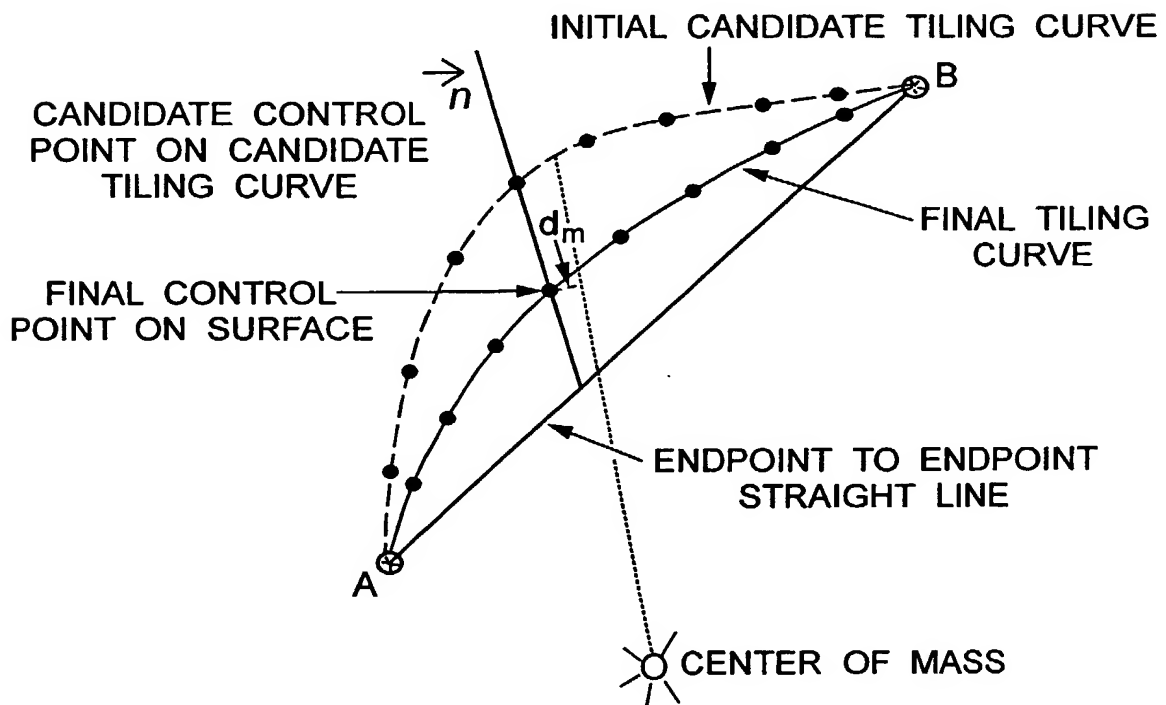
TEMPLATE WARPED TO TYPE II LANDMARK POSITIONS.

FIG. 21B

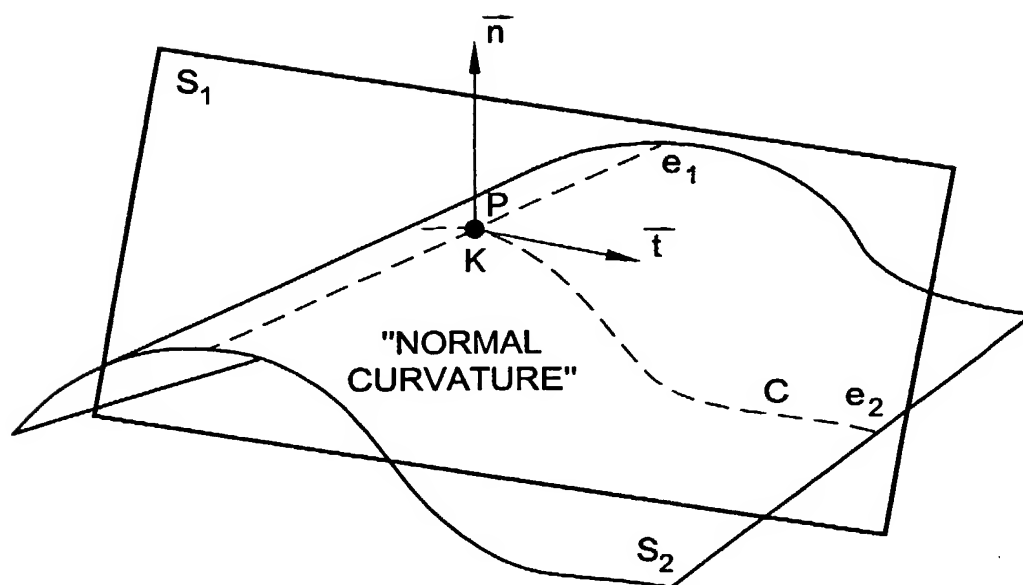




PLANE CONTAINING TILING CURVE END POINTS A AND B
(TYPE II LANDMARKS) AND CENTER OF MASS

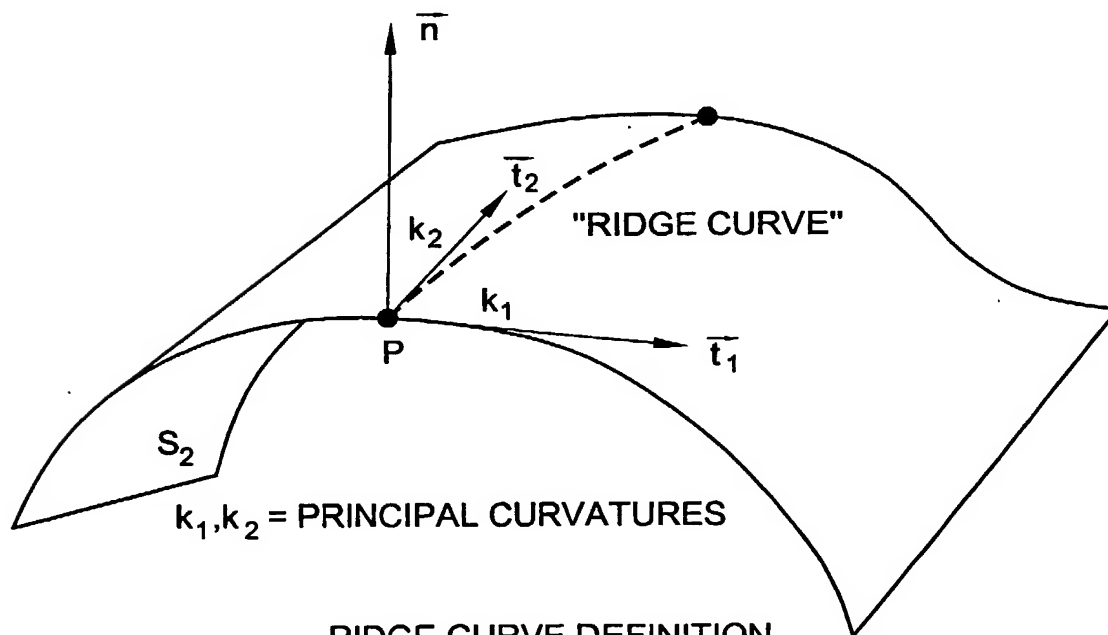


THREE DIMENSIONAL VIEW OF DEVIATION MEASURE, d_m .



DIFFERENTIAL CHARACTERISTICS
OF SURFACES

FIG. 22A



$k_1, k_2 = \text{PRINCIPAL CURVATURES}$

RIDGE CURVE DEFINITION

FIG. 22B

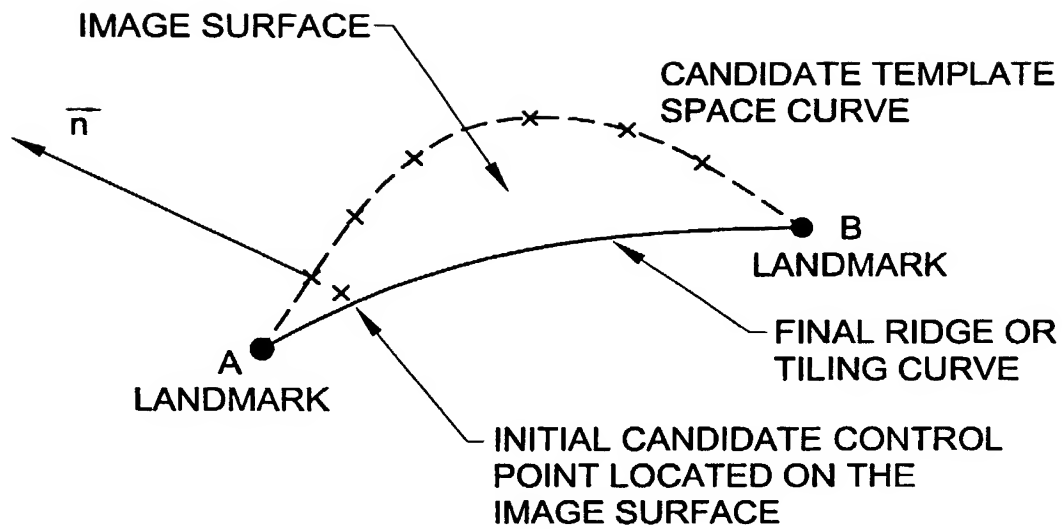
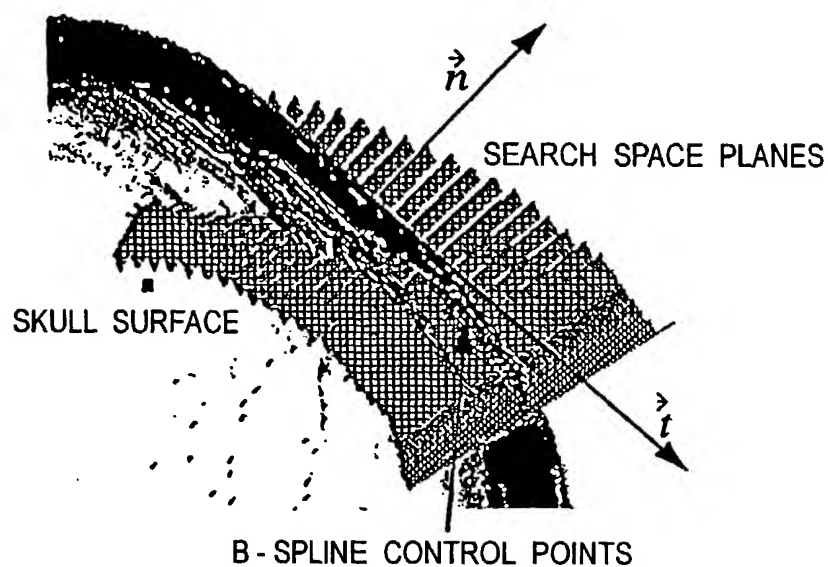


FIG. 24



CROSS SECTION OF SKULL SURFACE SHOWING SEARCH PLANES.

FIG. 25A

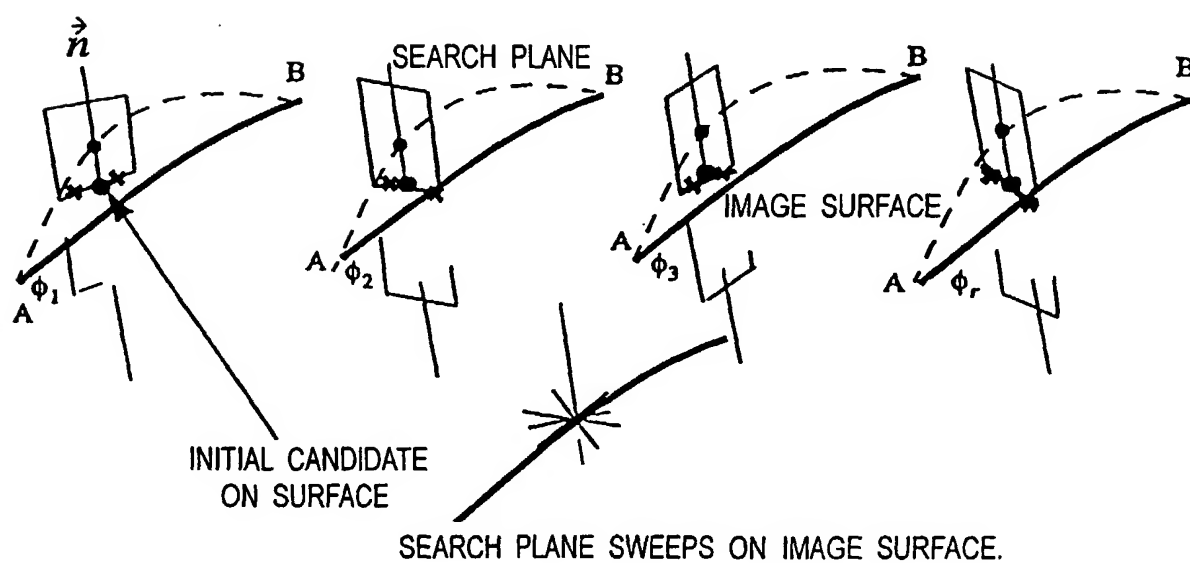
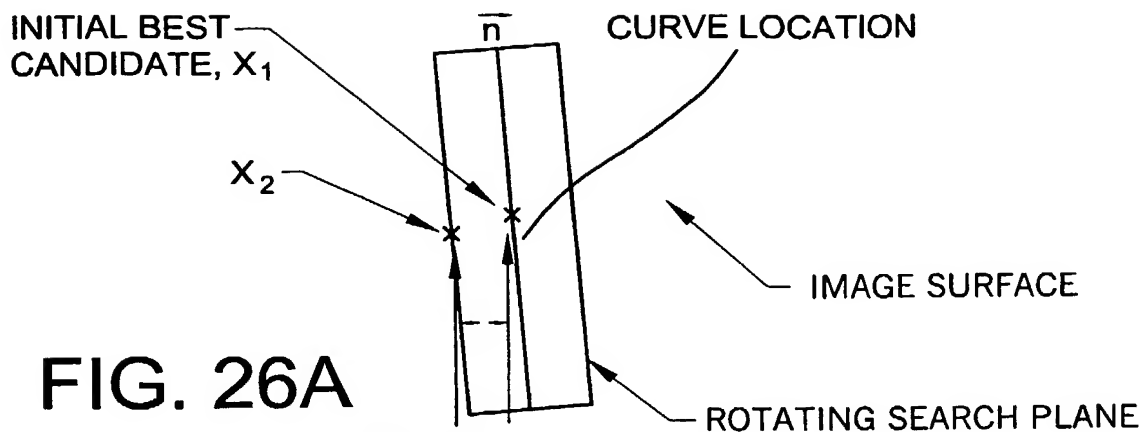
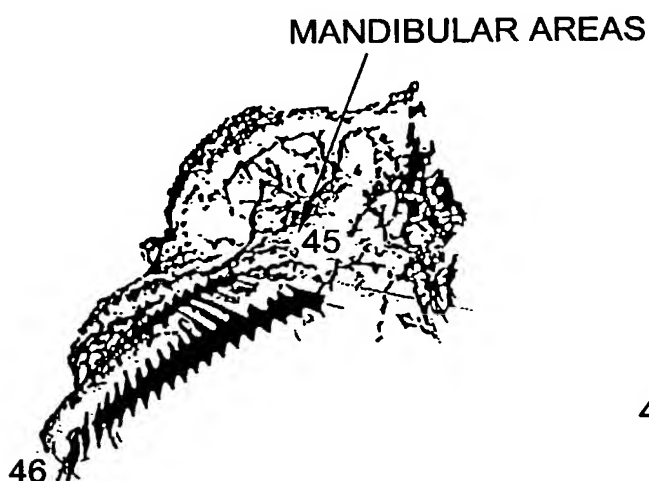


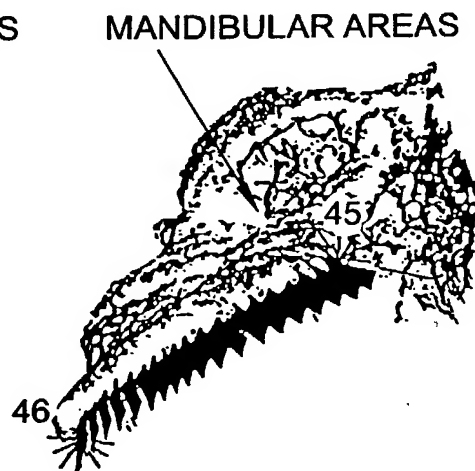
FIG. 25B

**FIG. 26A**

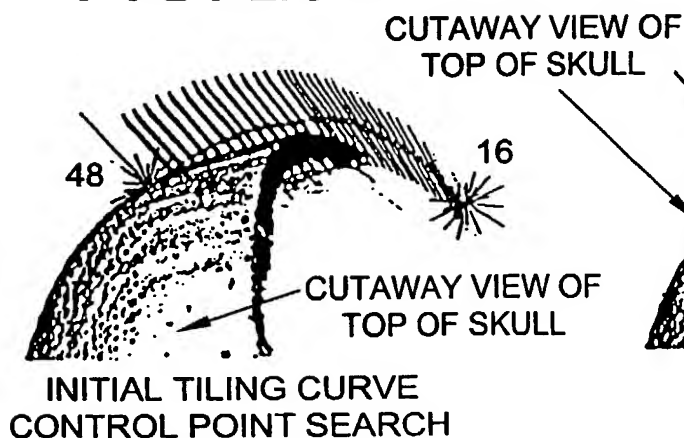
COST FUNCTION DETERMINES
WHICH CANDIDATE CONTROL POINT
IS ON THE RIDGE CURVE



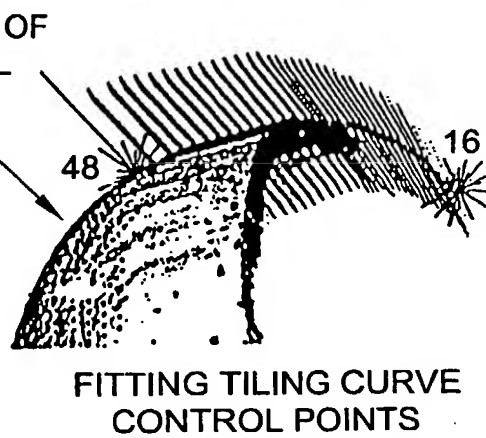
INITIAL RIDGE CURVE
CONTROL POINT SEARCH

FIG. 26B

FITTED RIDGE CURVE
CONTROL POINTS

FIG. 26C

INITIAL TILING CURVE
CONTROL POINT SEARCH

FIG. 26D

FITTING TILING CURVE
CONTROL POINTS

FIG. 26E

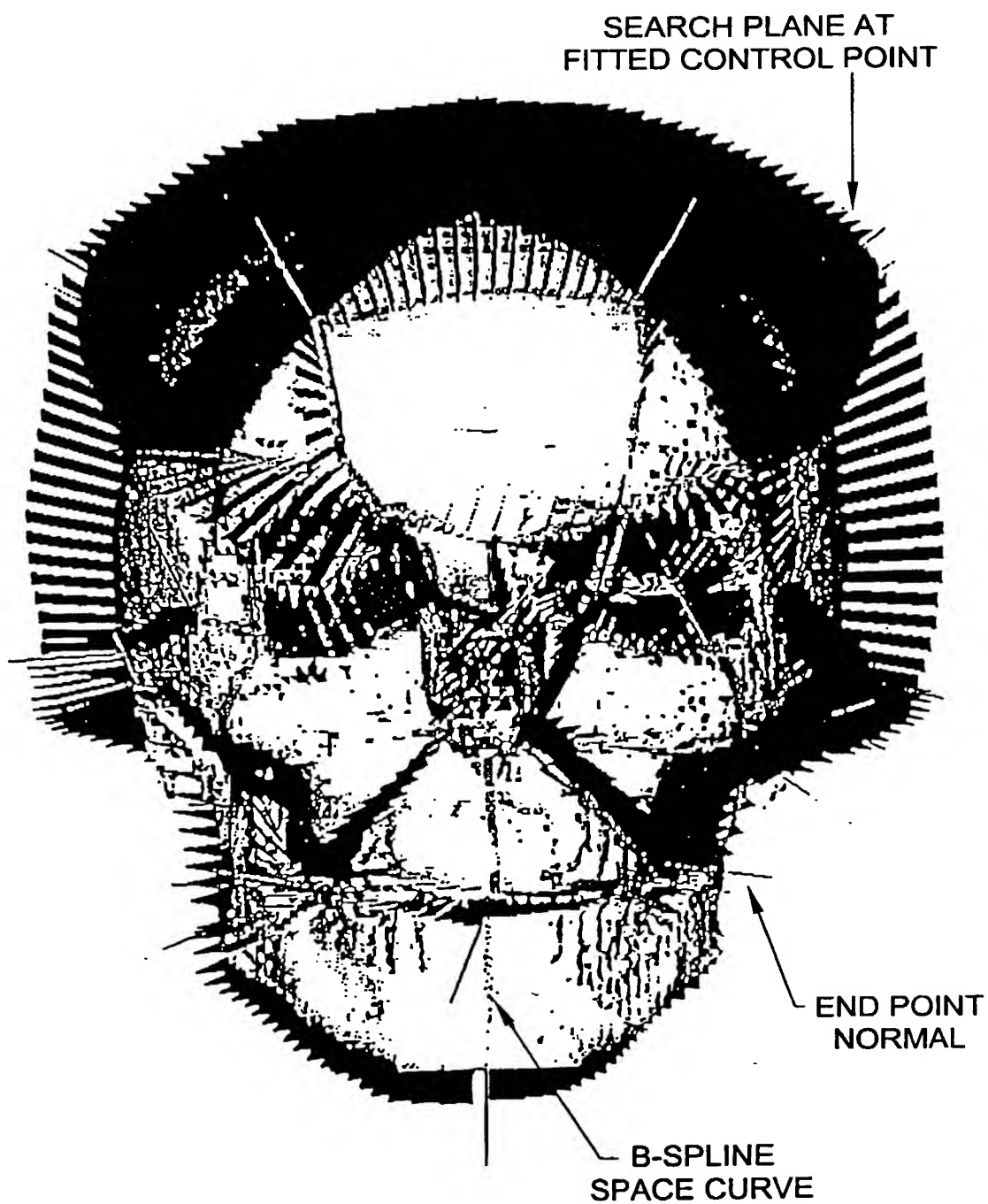


FIG. 27

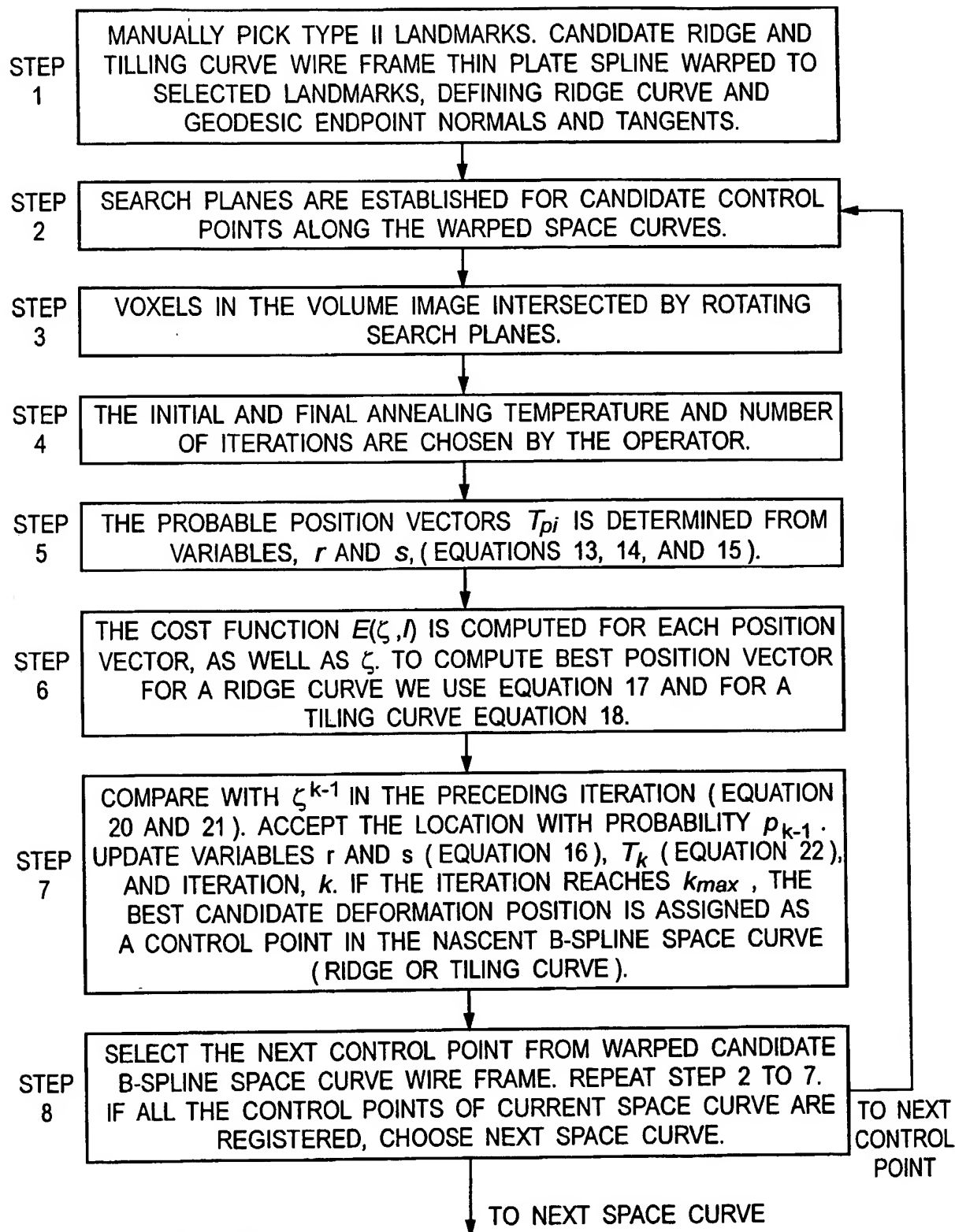


FIG. 28

10/089467

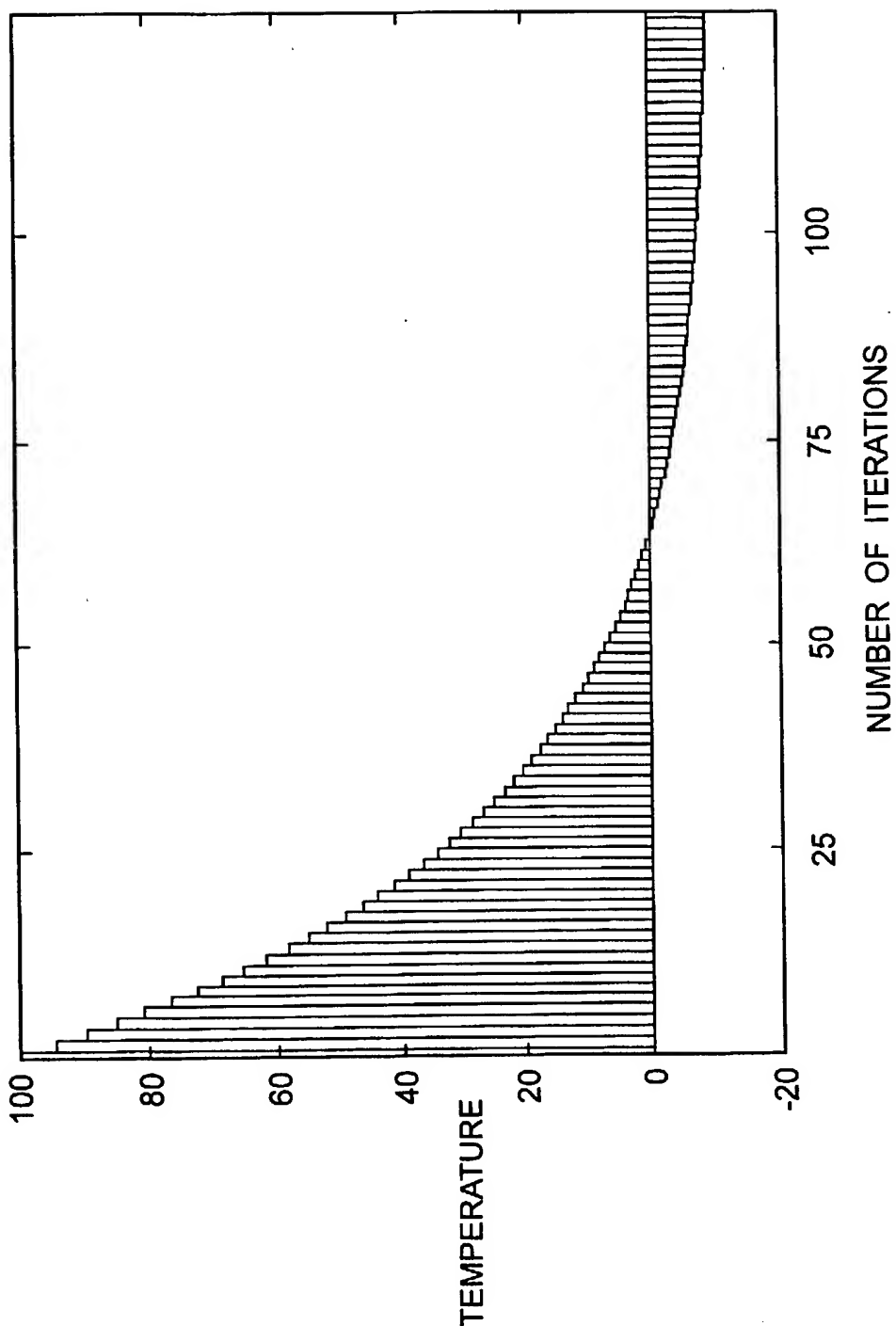


FIG. 29

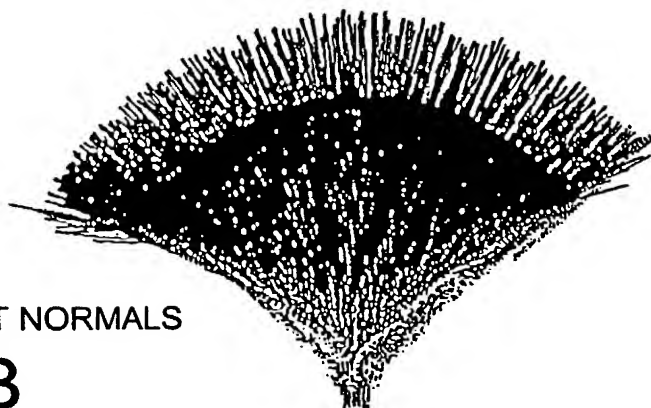
CURVE POINT NORMALS

FIG. 30A



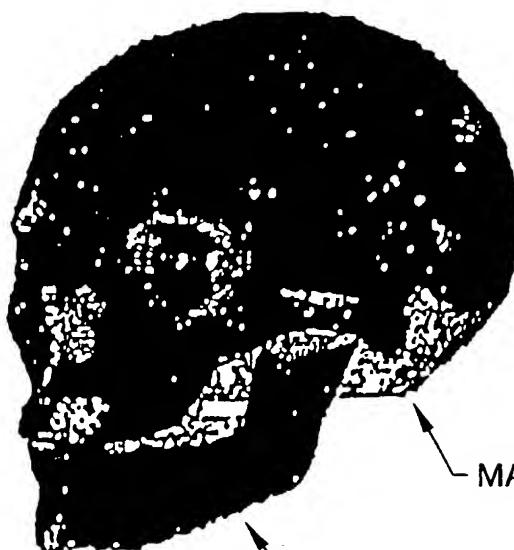
SURFACE TILE POINT NORMALS

FIG. 30B



FITTED TEMPLATE SURFACE

FIG. 30C



MANIFOLD

TEMPLATE

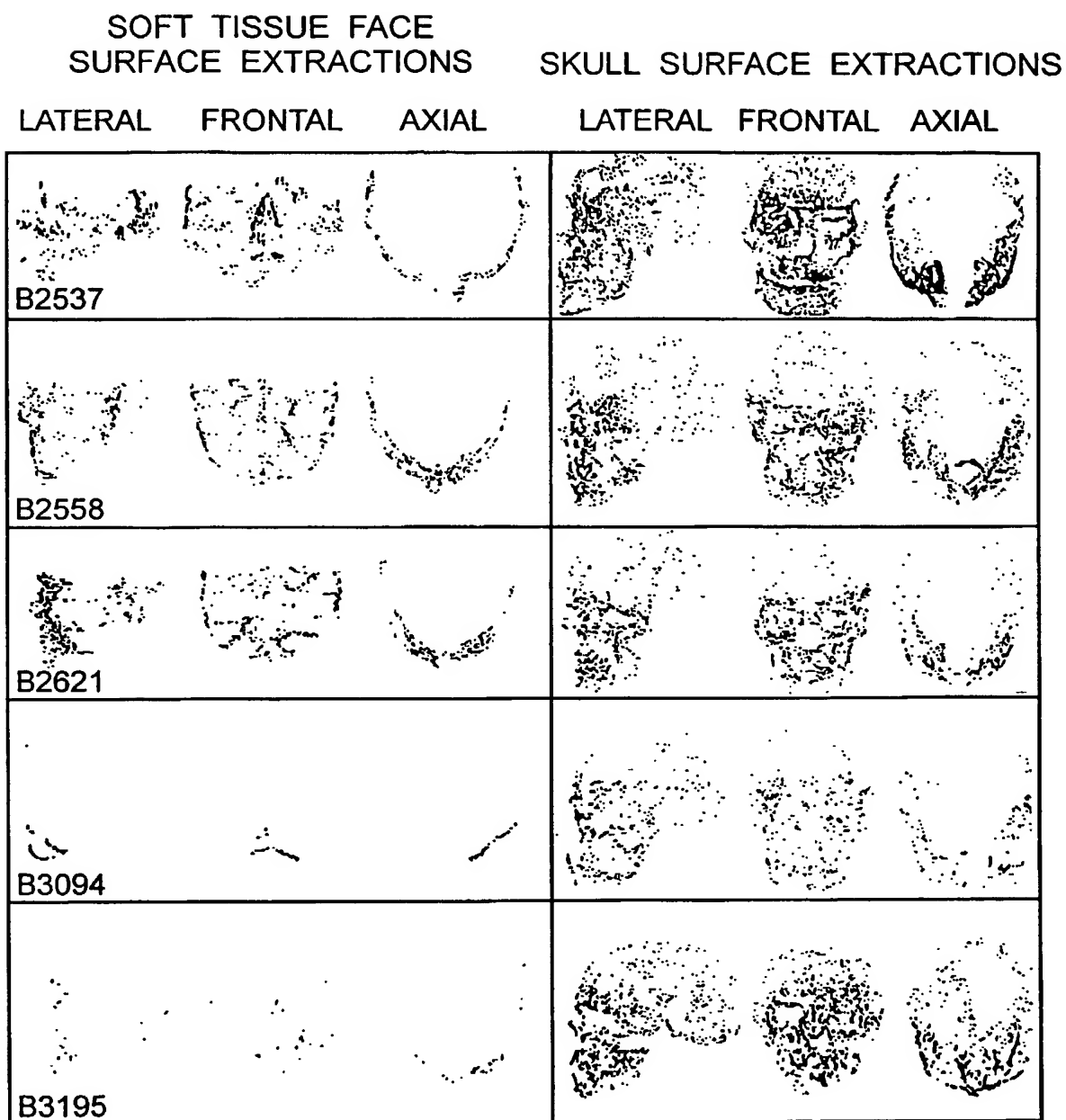
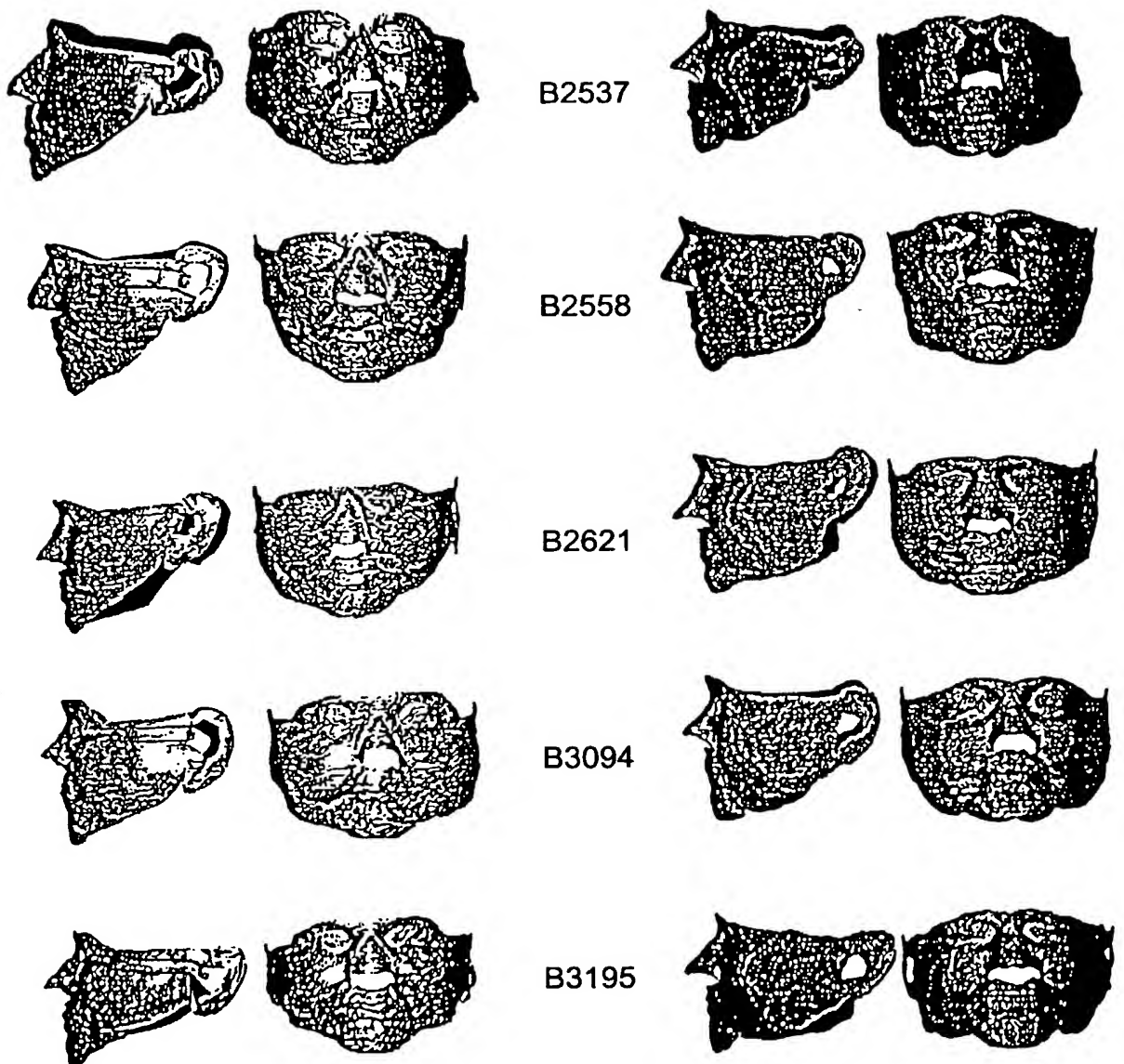


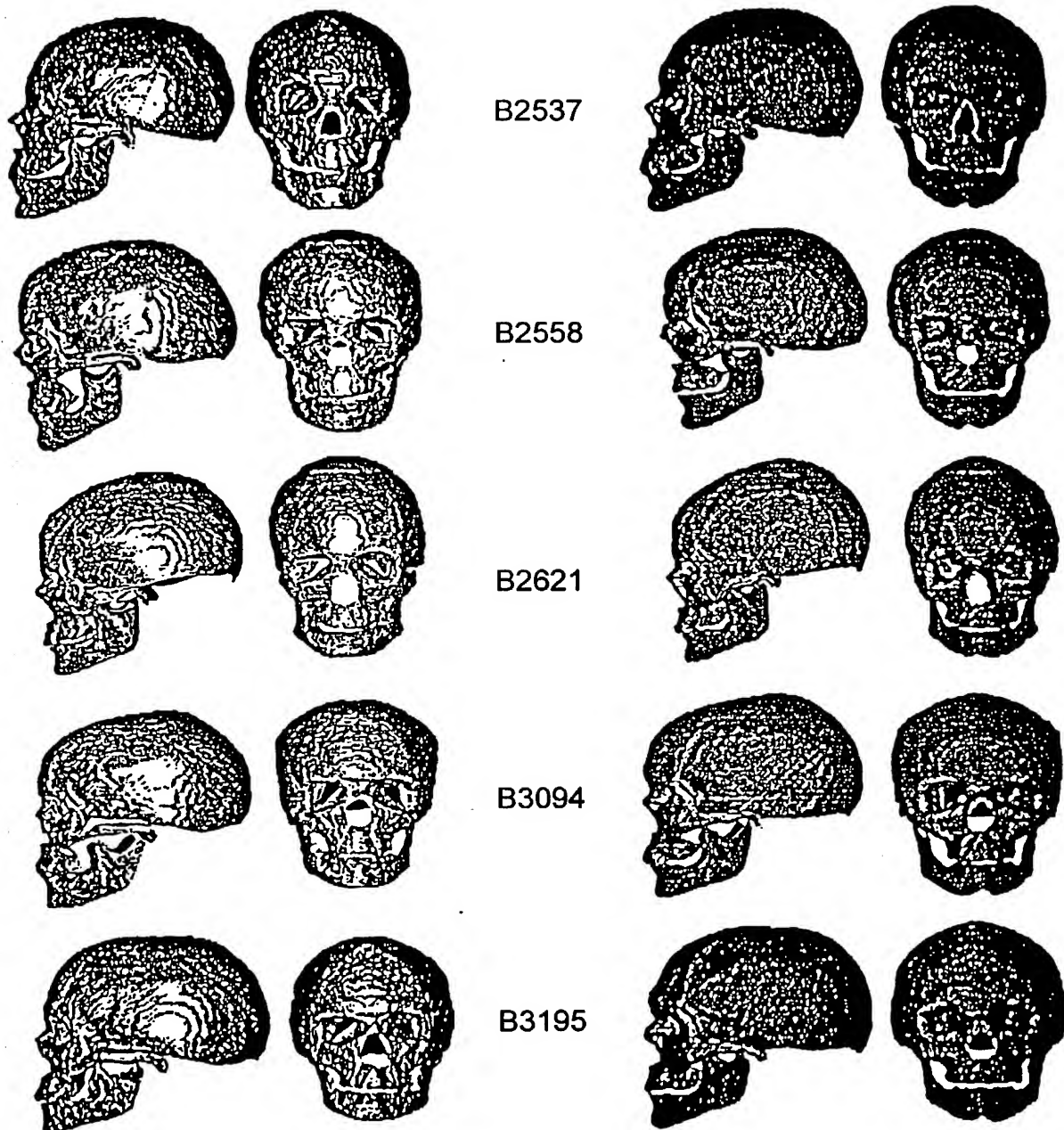
FIG. 31



SASE SURFACE EXTRACTIONS

NYU SURFACE EXTRACTIONS

FIG. 32A



SASE SURFACE EXTRACTIONS

NYU SURFACE EXTRACTIONS

FIG. 32B

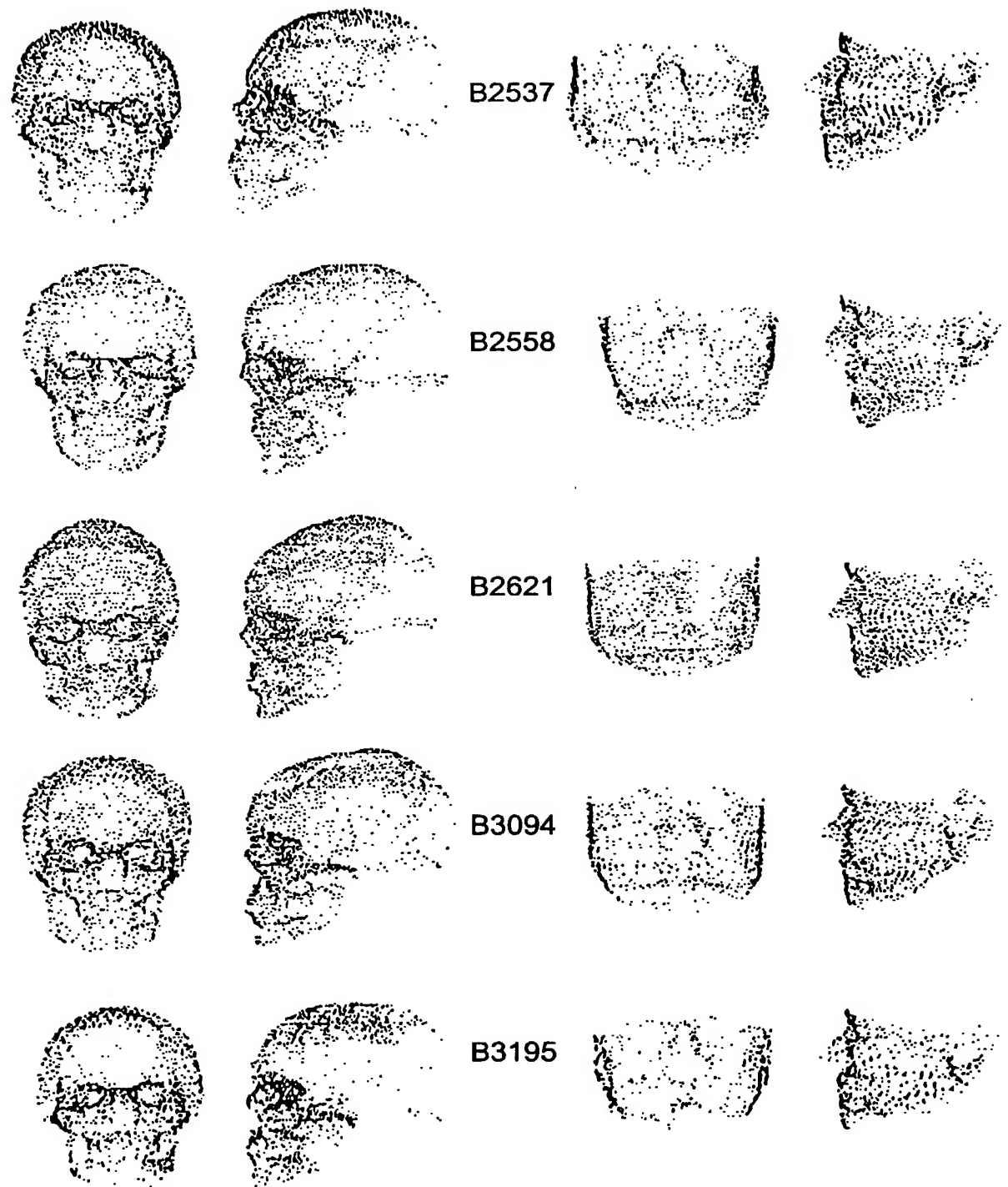


FIG. 33A

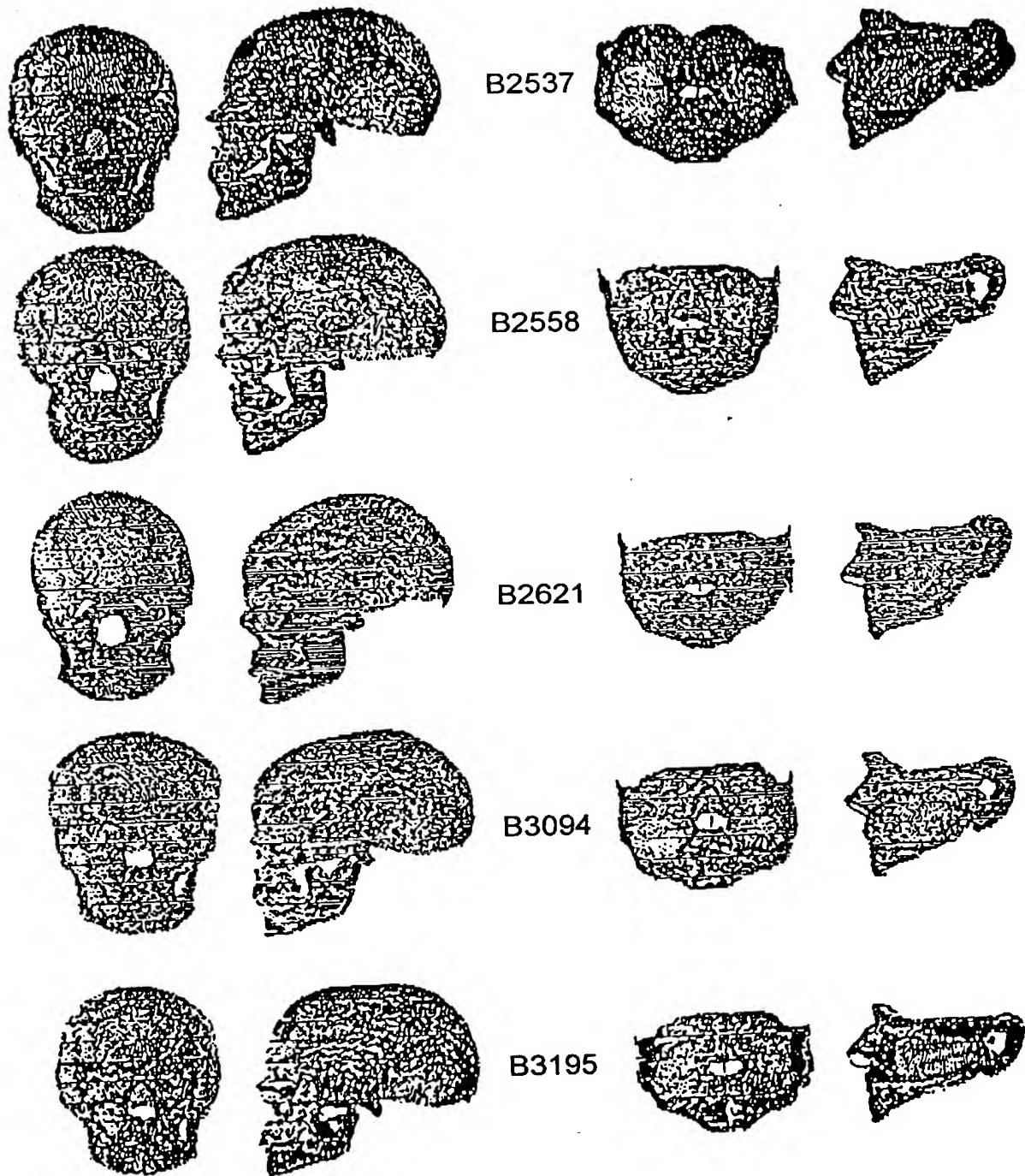
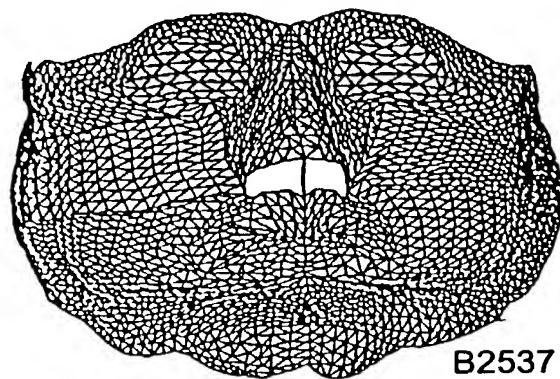
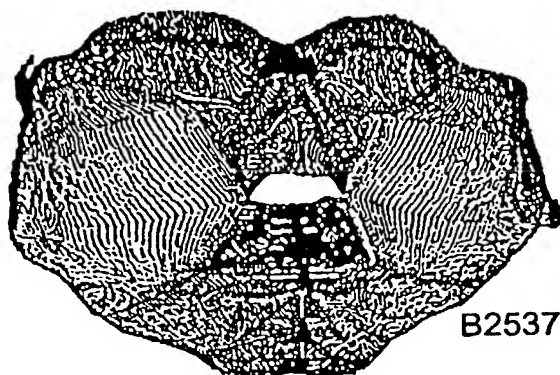


FIG. 33B

SOFT TISSUE SURFACE EXTRACTION
(SURFACE TILE POINT DISTRIBUTION)

SASE

NYU



NUMBER OF VERTICES: 106376

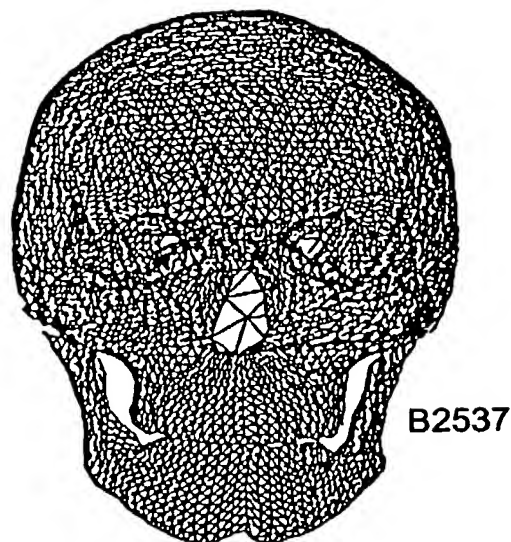
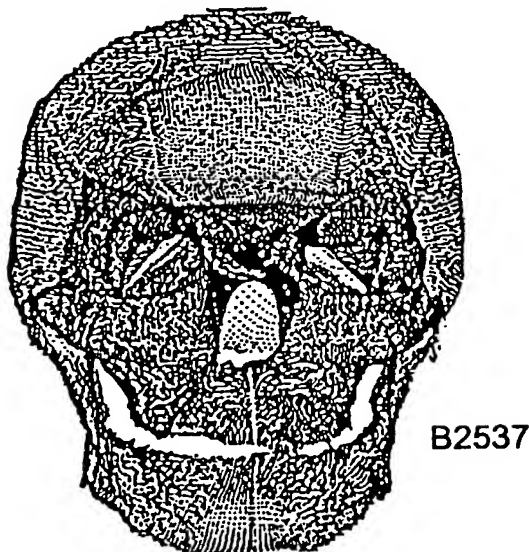
NUMBER OF VERTICES: 2225

FIG. 34A

BONEY SKULL SURFACE EXTRACTION
(SURFACE TILE POINT DISTRIBUTION)

SASE

NYU



NUMBER OF VERTICES: 113334

NUMBER OF VERTICES: 6440

FIG. 34B

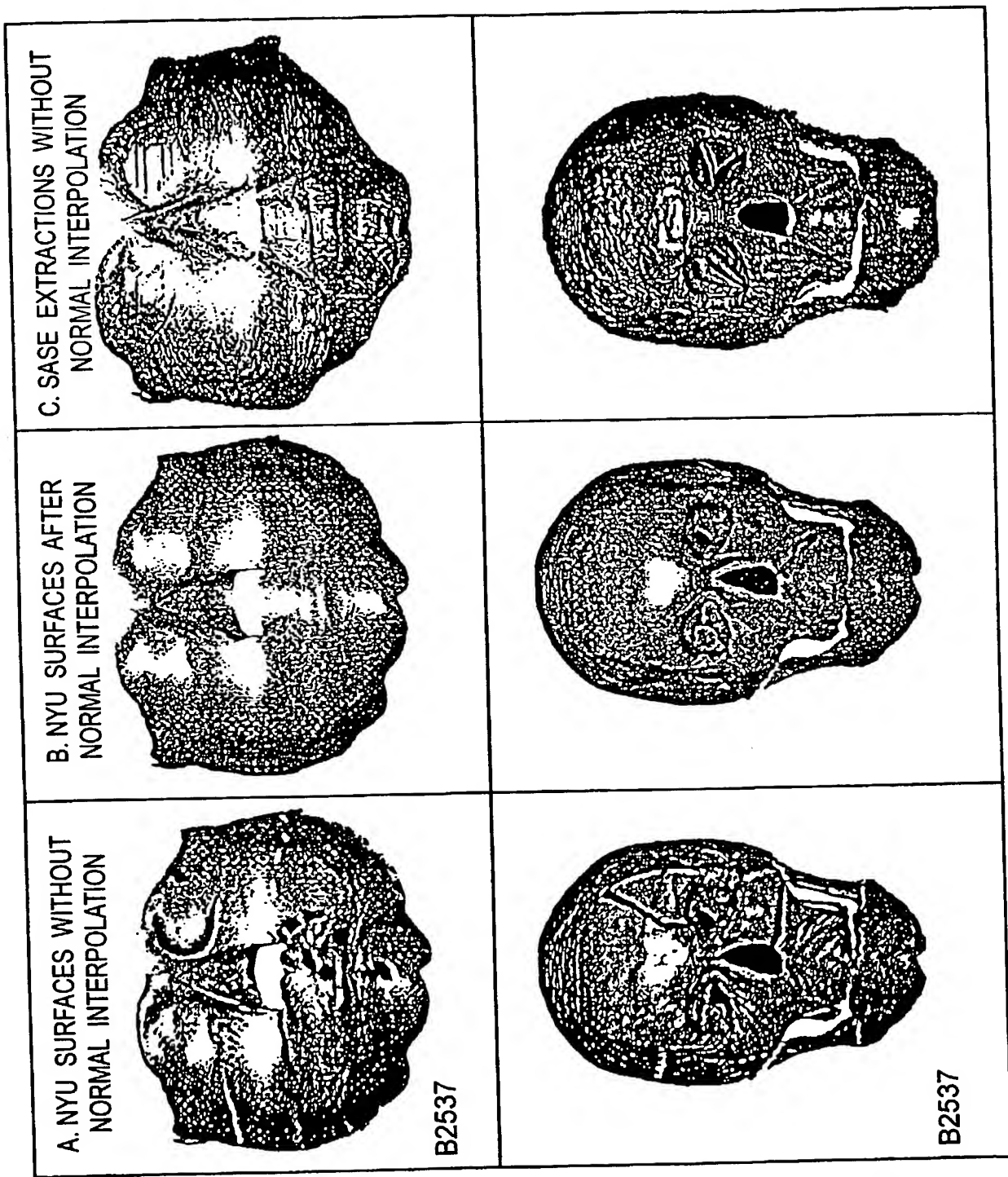


FIG. 35

- TILE BOUNDARY CURVES
--- INTERIOR TILE SPACE CURVES ALONG U DIRECTION
--- INTERIOR TILE SPACE CURVES ALONG V DIRECTION
⊗ TYPE II LANDMARKS
● COON'S INTERPOLATED B-SPLINE CURVE POINT
○ THE BOUNDARY SPACE CURVE POINT

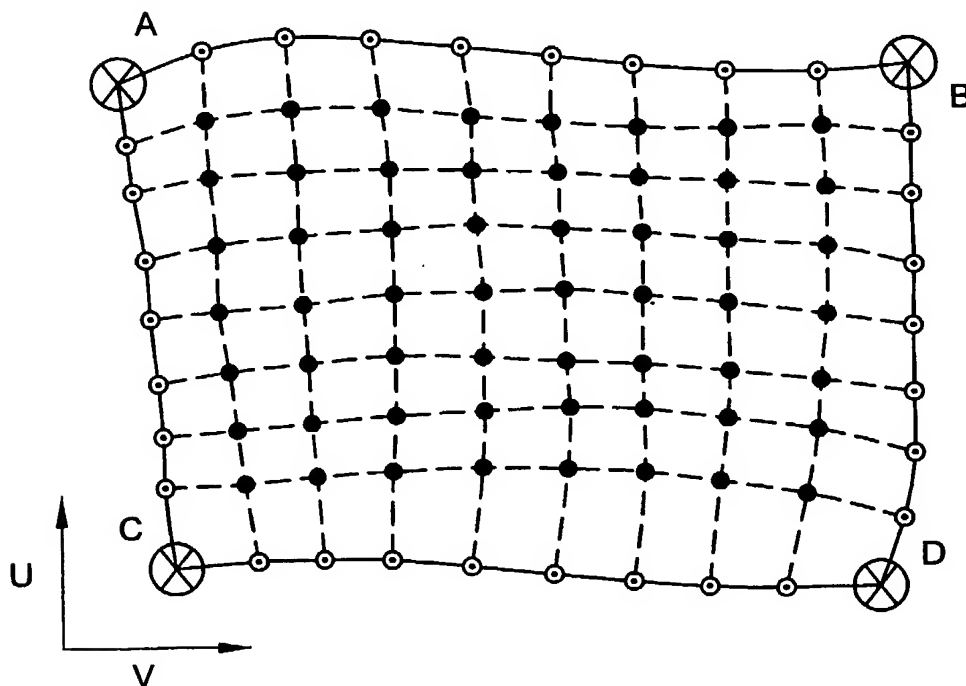


FIG. 36A

- TILE BOUNDARY CURVES
- INTERIOR TILE SPACE CURVES ALONG U DIRECTION
- INTERIOR TILE SPACE CURVES ALONG V DIRECTION
- ⊗ TYPE II LANDMARKS
- COON'S INTERPOLATED B-SPLINE CURVE POINT
- TILE BOUNDARY SPACE CURVE POINT

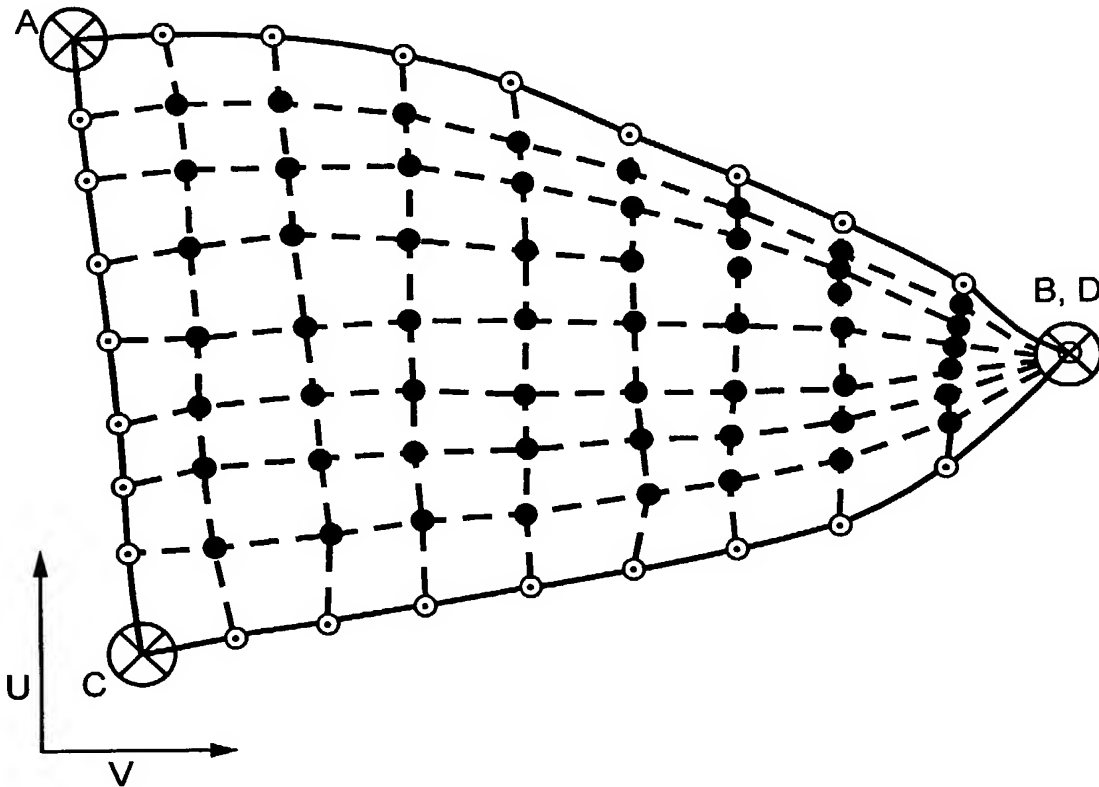


FIG. 36B

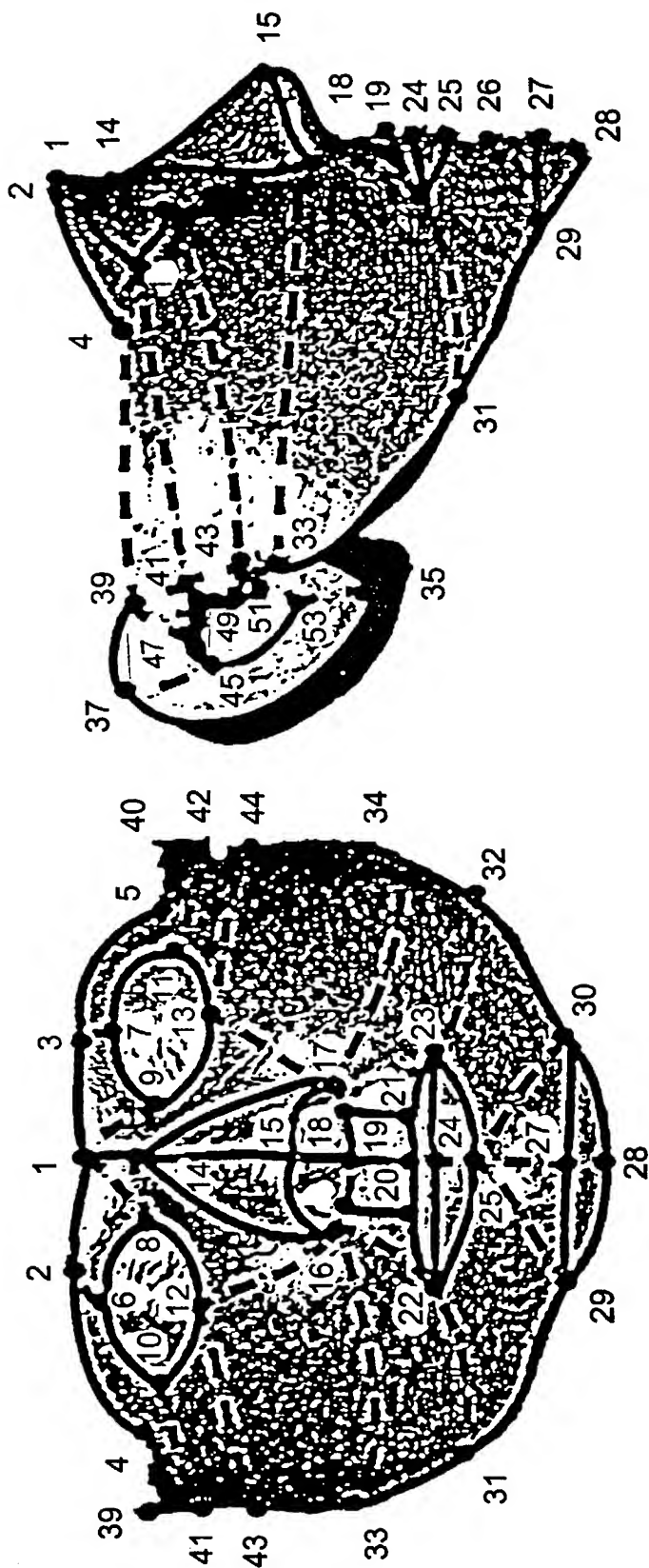


FIG. 37A

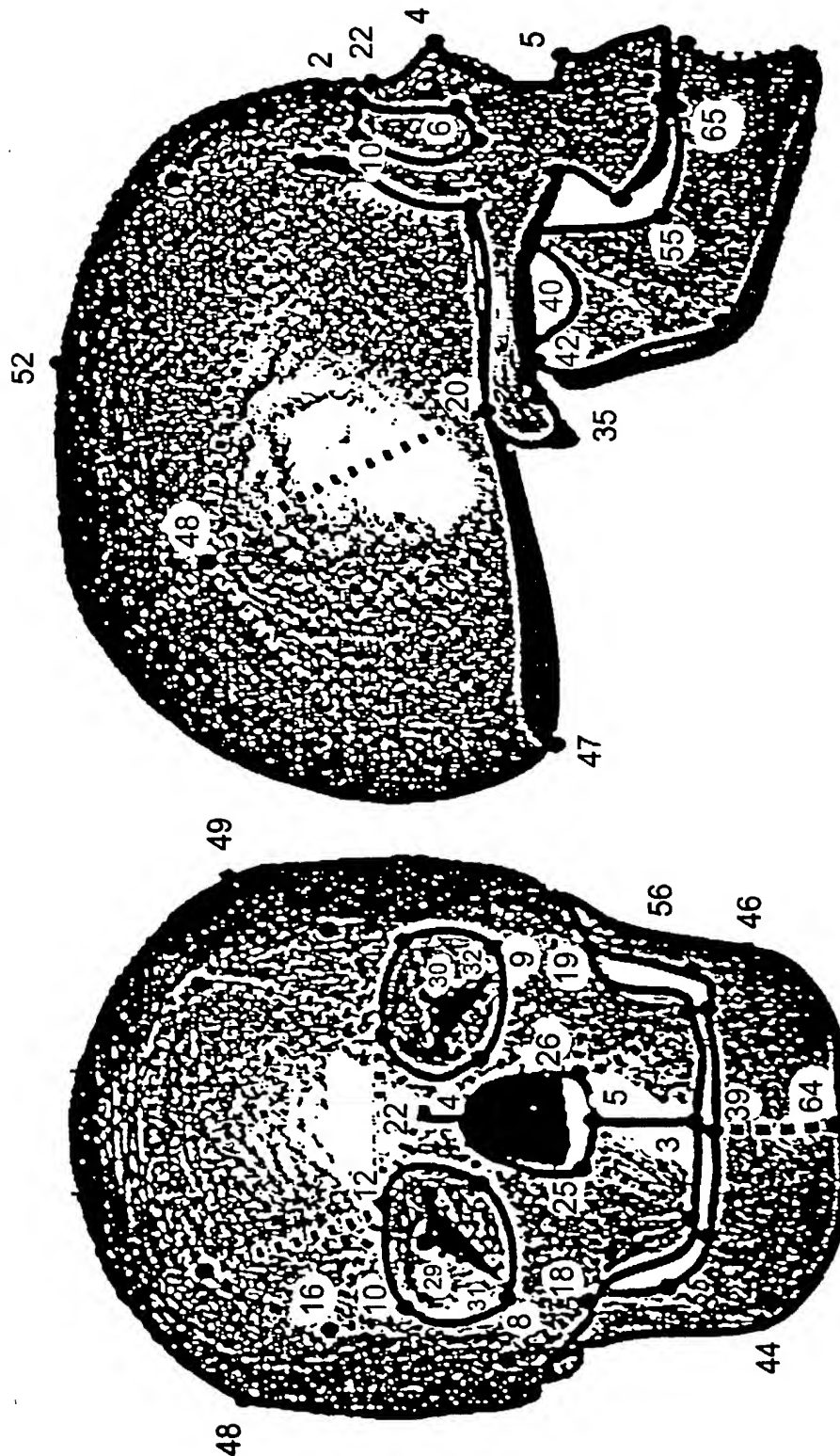


FIG. 37B

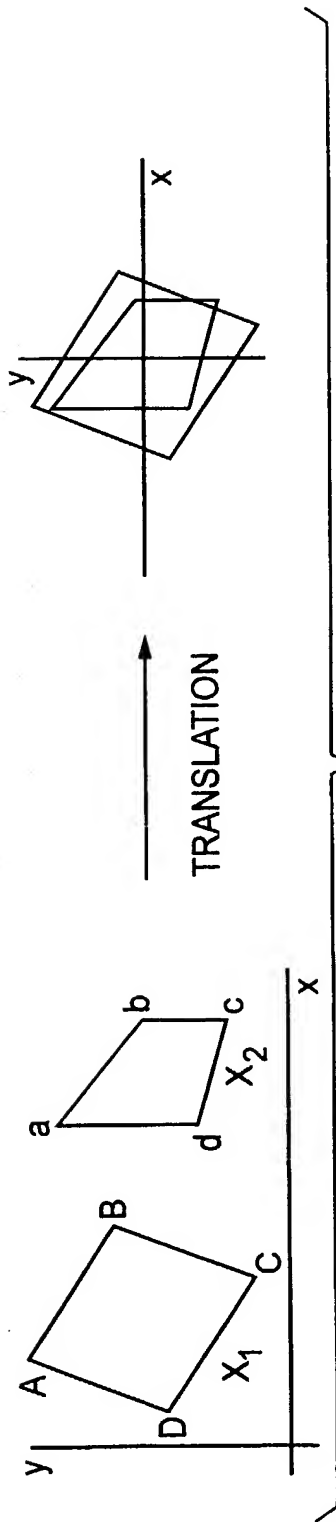


FIG. 38A

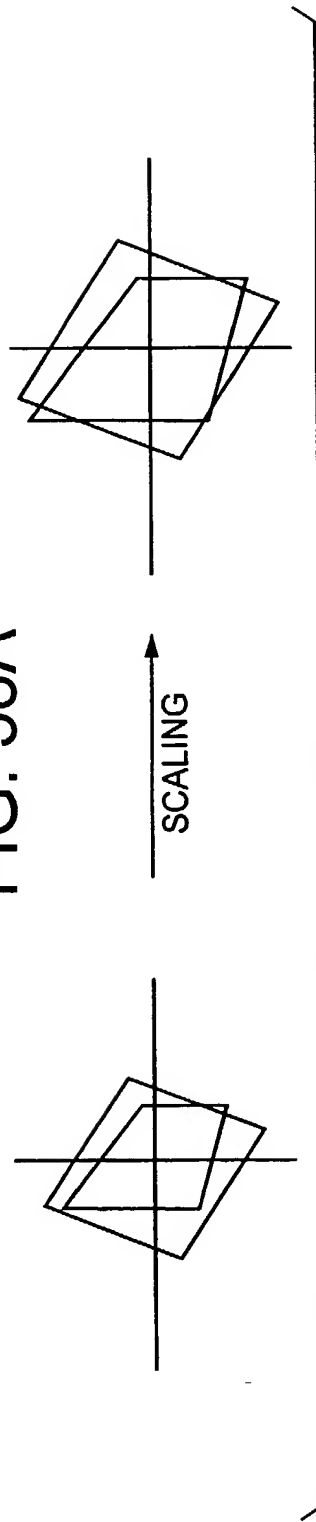


FIG. 38B

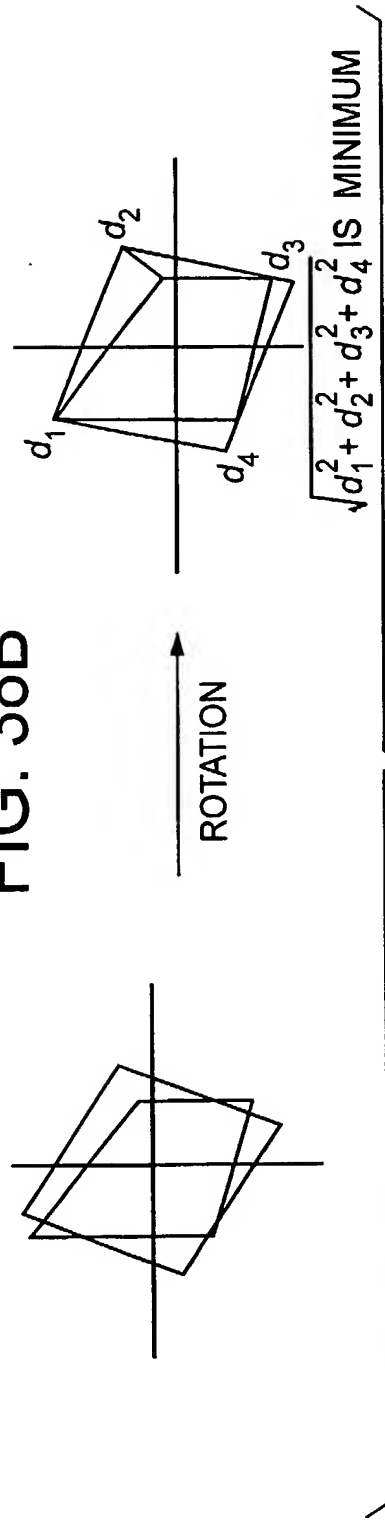
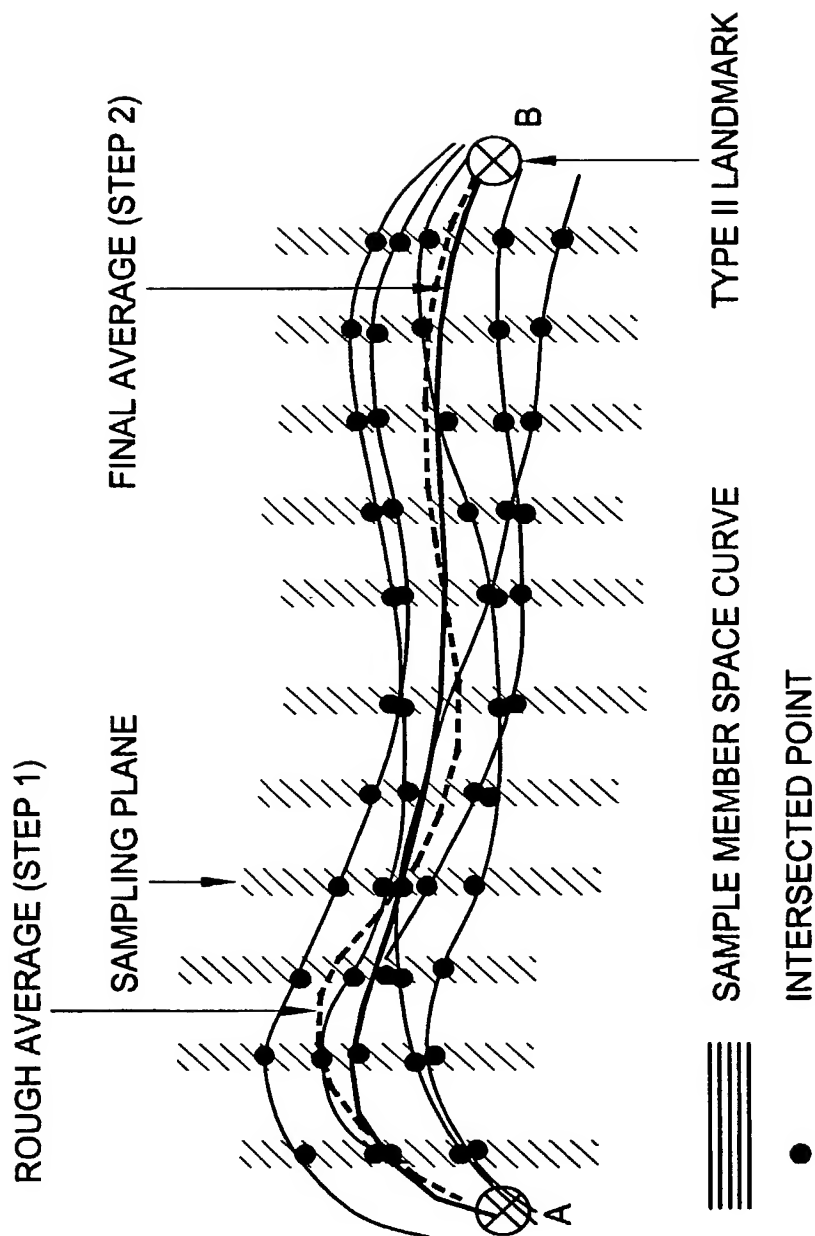







FIG. 38C



SPACE CURVE AVERAGING PROCEDURE

FIG. 39

B2537-  B2558-  B2621-  B3094-  B3195- 



FIVE PATIENT FACE SURFACES (SPACE CURVES AND SURFACE TILES)
IN THEIR ORIGINAL CT SPACE.



AVERAGE FACE SURFACE
(AVERAGE SPACE CURVES AND TRIANGULATED SURFACE TILES).

FIG. 40A

B2537 B2558 B2621 B3094 B3195



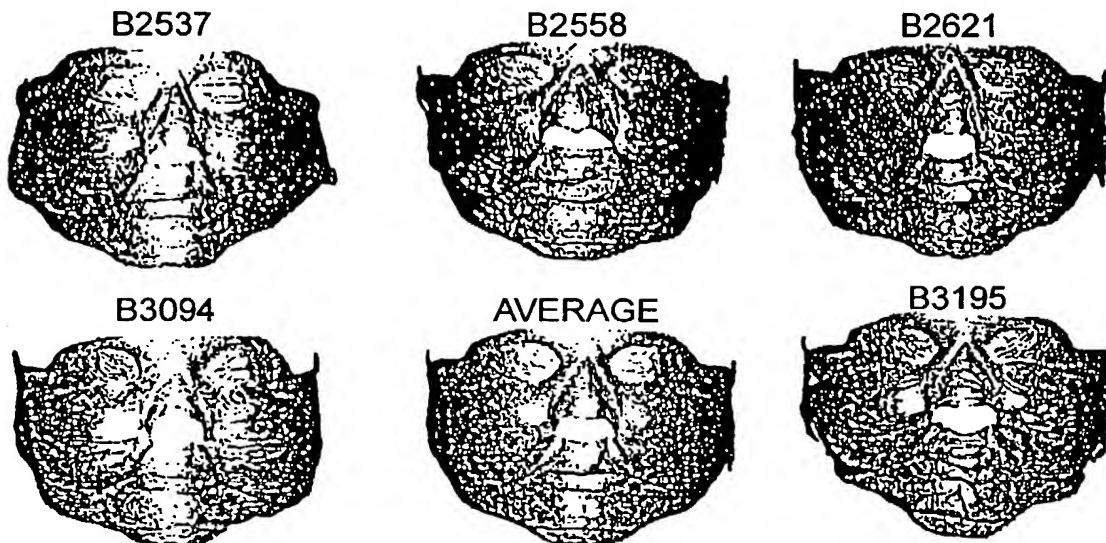
FIVE PATIENT SURFACES (SPACE CURVES AND SURFACE TILES)
IN THEIR ORIGINAL CT SPACE



AVERAGE BONEY SKULL SURFACE
(AVERAGE SPACE CURVES AND TRINAGULATED SURFACE TILES)

FIG. 40B

SSA SOFT TISSUE FACE SAMPLE MEMBERS AND AVERAGE.



NYU SOFT TISSUE FACE SAMPLE MEMBERS AND AVERAGE.

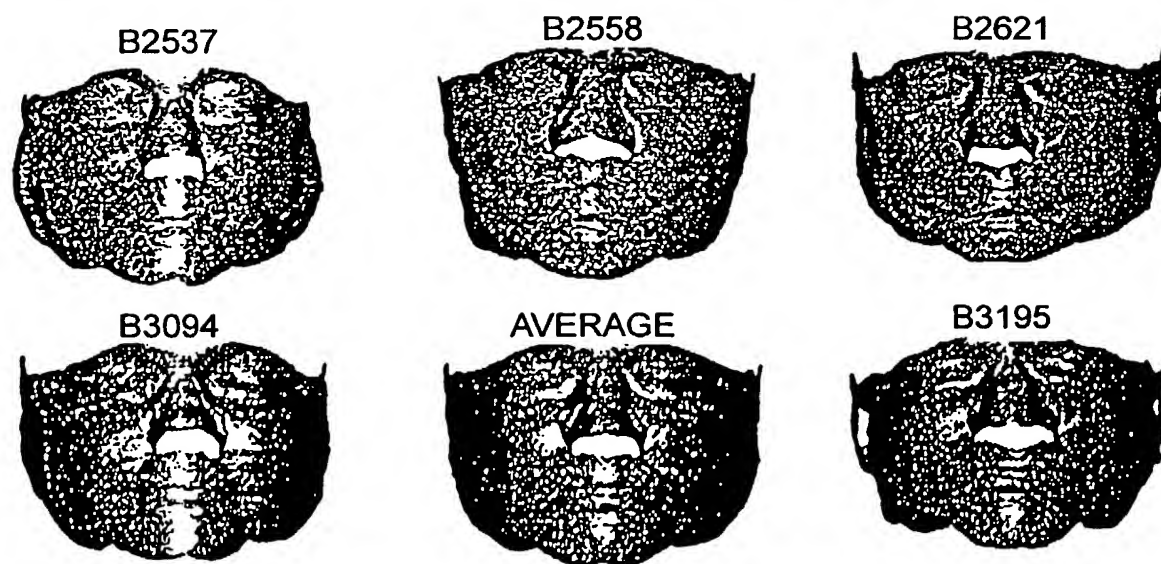
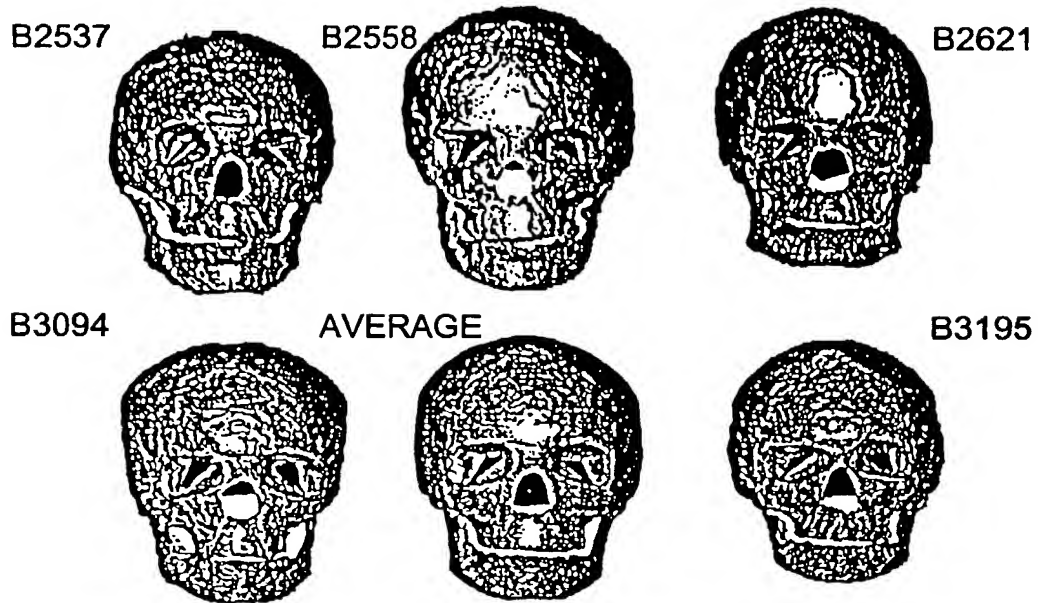


FIG. 41A

SSA SKULL SURFACE MEMBERS AND AVERAGE



NYU SKULL SURFACE MEMBERS AND AVERAGE

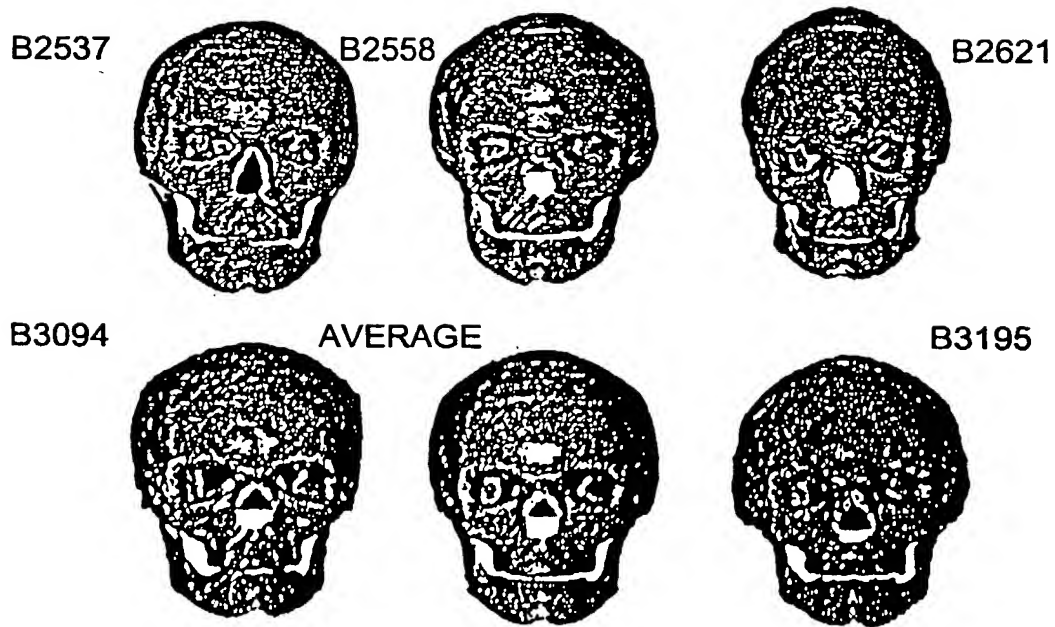


FIG. 41B

SUBSTITUTE SHEET (RULE 26)

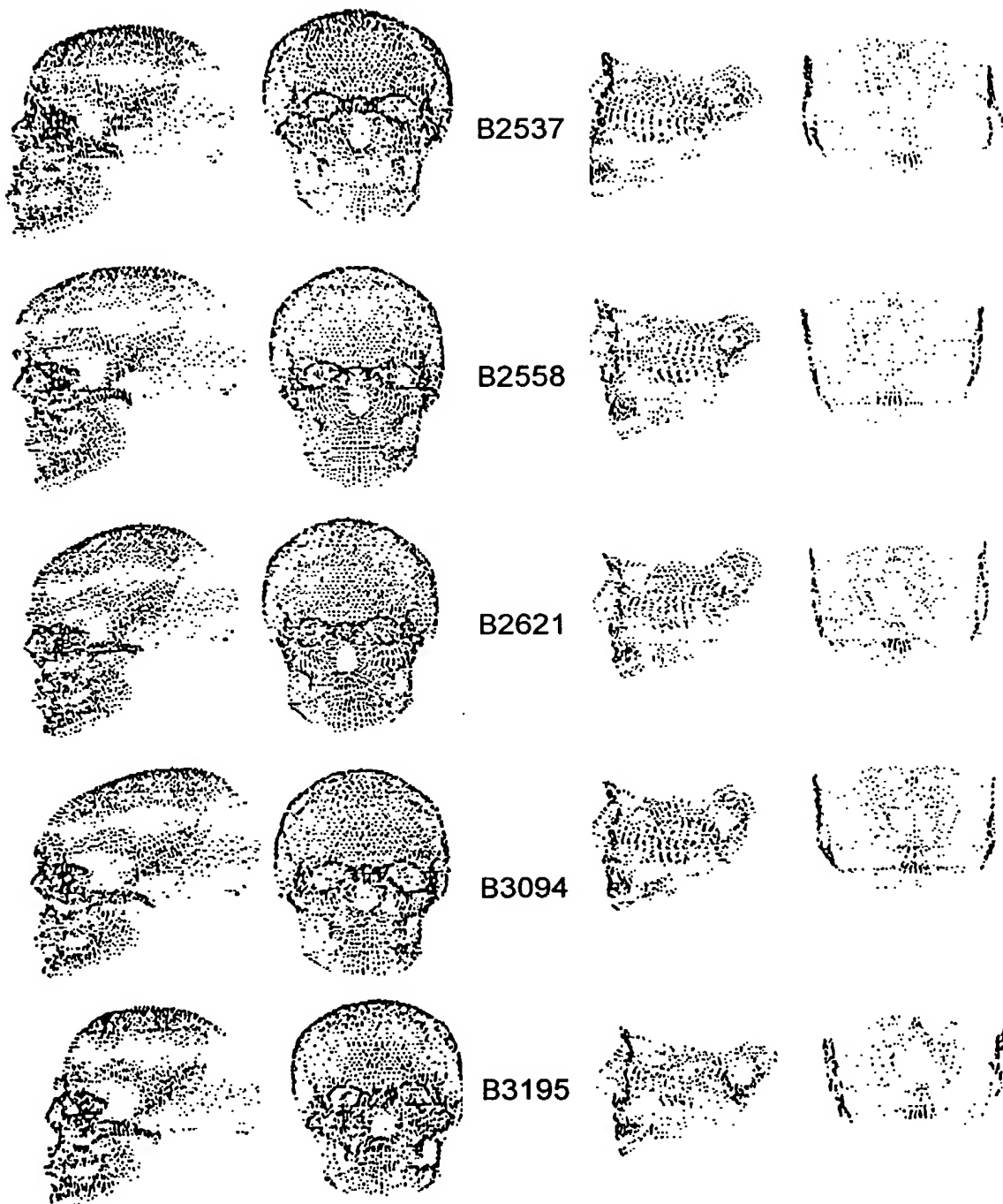


FIG. 42A

SUBSTITUTE SHEET (RULE 26)

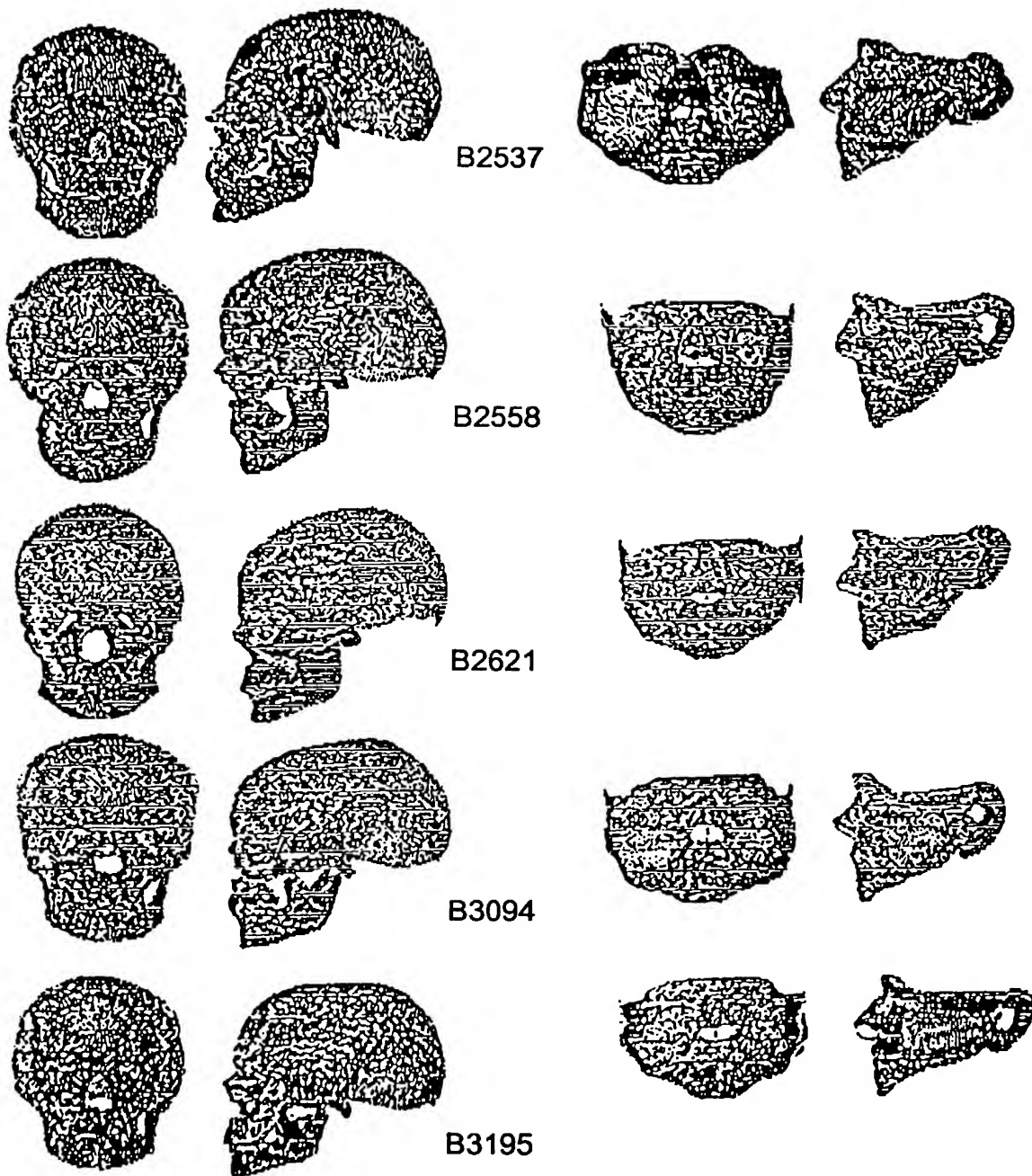
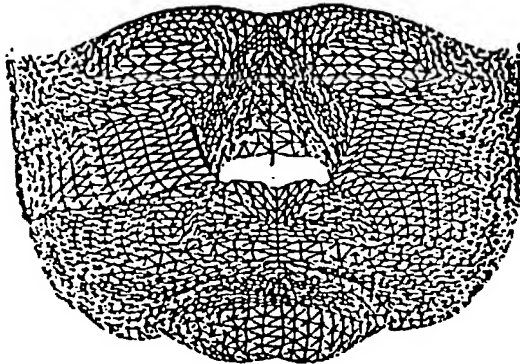


FIG. 42B

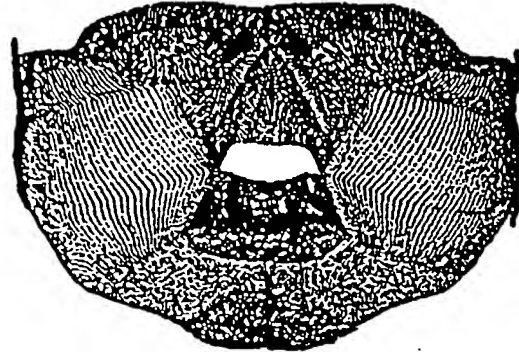
NYU SOFT TISSUE
FACE AVERAGE



2225 VERTICES
NYU SURFACE TILE
POINT DENSITY.

FIG. 43A

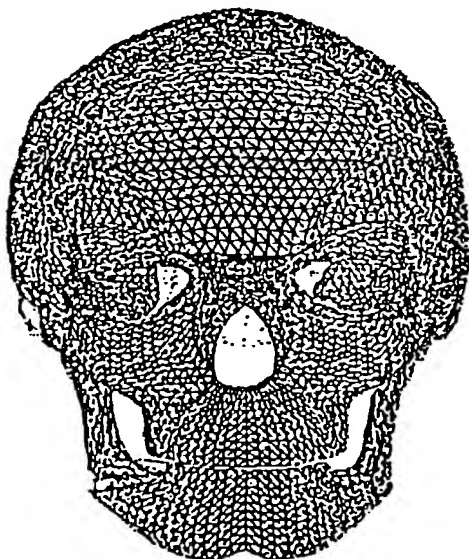
SSA SOFT TISSUE
FACE AVERAGE



106376 VERTICES
SSA FACE SURFACE TILE
POINT DENSITY.

FIG. 43B

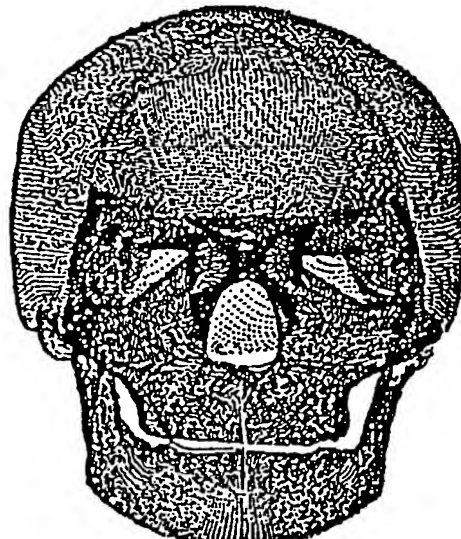
NYU SKULL AVERAGE



6440 VERTICES
NYU SKULL SURFACE TILE
POINT DENSITY.

FIG. 43C

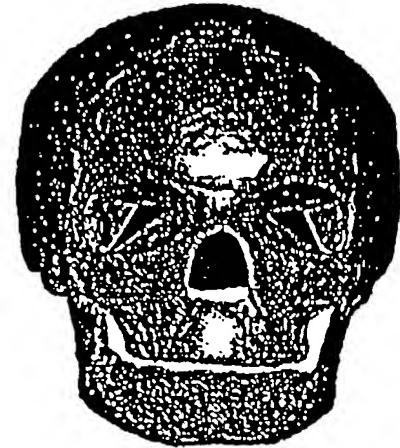
SSA SKULL AVERAGE.



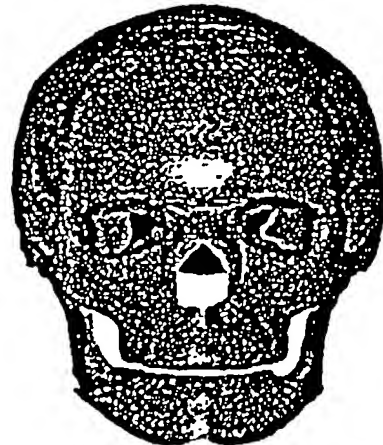
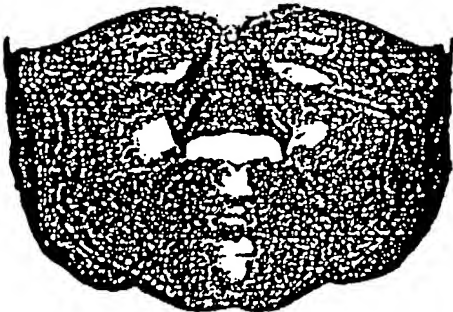
113334 VERTICES
SSA SKULL SURFACE TILE
POINT DENSITY.

FIG. 43D

SSA AVERAGE SURFACES



NYU AVERAGE SURFACES
AFTER INTERPOLATED NORMALS



NYU AVERAGE SURFACES
PRIOR TO NORMAL INTERPOLATION



FIG. 44